MOTOMAN XRC
USER'S MANUAL
Ladder Editor 32 version 1.2

Upon receipt of the product and prior to initial operation, read these instructions thoroughly, and retain for future reference.

MOTOMAN ROBOTICS EUROPE
A subsidiary of YASKAWA Electric Corporation

MANUAL NO. MRS55130

Reference list

Basic Operator's Manual
Windows User's Manual

Revision

000816
First issue of this manual. Produced with japanese orginal word-document as template.

Revision

010405
Update to version 1.2.

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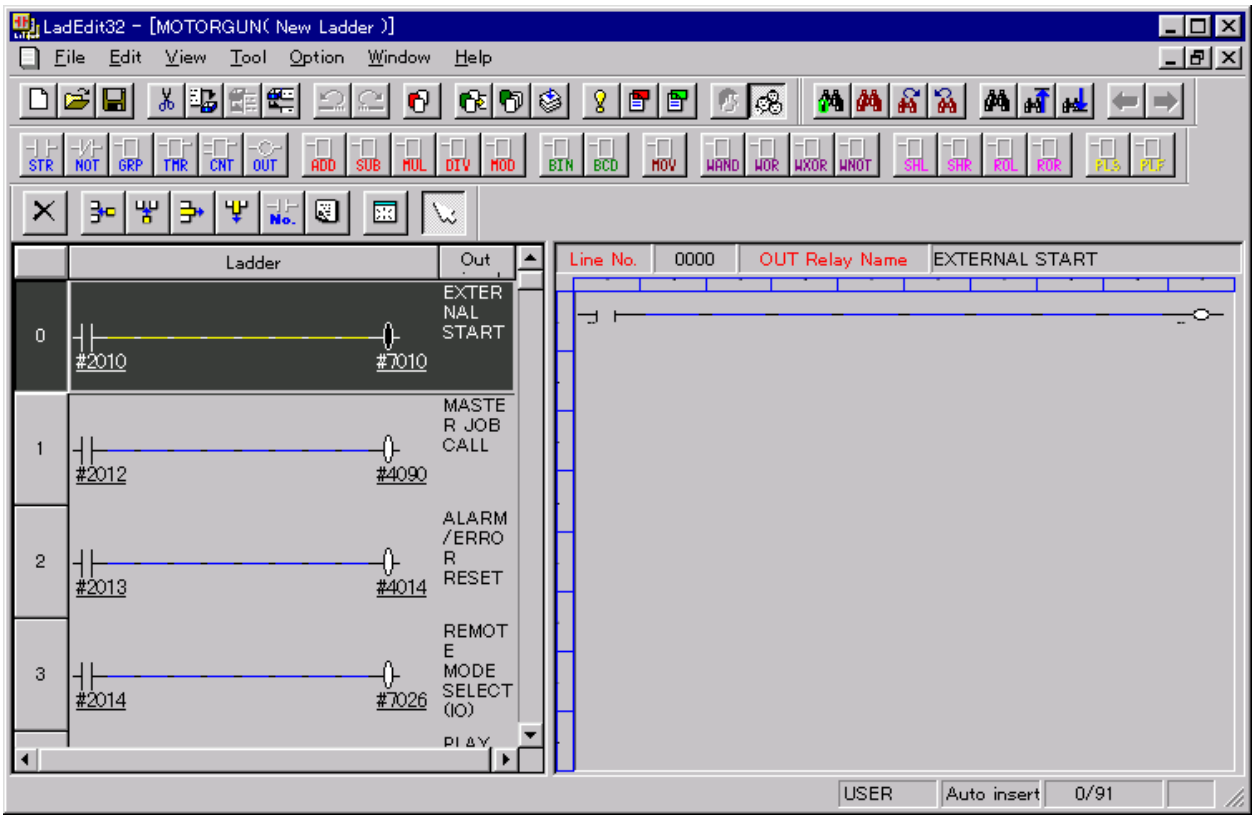
Ladder Editor 32 (32-bit)

Manual valid for Ladder Editor 32 (Motoman part No. 441138-80).



1. General

Ladder Editor 32 is a 32-bit PC-software, for Windows (95/98 or NT) environment. The robot controller (YASNAC XRC) has a concurrent I/O function that processes I/O related control independently from the manipulator, and in parallel with the manipulator operation. Ladder Editor 32 software is used to graphically display ladder programs with the above function as a signal connection diagram, or to edit commands by drag and drop operation using the mouse.

For more basic information about installation and handling of the software, icons, menu bars, etc. refer to the operator's manual for Windows 95/98 or Windows NT.

✔ This manual shall always be available to operator.

✔ This User's Manual comprises information about

✔ Installation / Setup / Handling / operation for XRC robot controller

✔ Text written in **BOLD** letters means command, icon or button.

✔ Text written in *ITALIC* means text shown on display.

1.1 Copyright

The disks for Ladder Editor 32-program may not be copied or imparted to a third party nor be used for an unauthorized purpose. Copies may be done only for own backup.

This manual may not be copied or imparted to a third party nor be used for an unauthorized purpose.

1.2 Ladder Editor 32-kit

■ *Ladder Editor 32-kit comprises*

✔ Diskettes (for Ladder Editor 32 and drivers) or CD-ROM

✔ Hardware key

✔ One manual

✔ One registration card

■ *Ladder Editor 32-kit does not comprise*

✔ Cables or adapters, etc.

■ *Further you may have need for*

✔ Programming manual for your robot controller.

✔ Operator's manual for Windows 95/98 or Windows NT.

1.3 General Precautions

Diagrams and photos in this manual are used as examples only and may differ from the actual delivered product.

This manual may be modified when necessary because of improvement of the product, modification, or changes in specifications.

Such modification is made as a revision by renewing the manual No.

To order a copy of this manual, if your copy has been damaged or lost, contact your YASKAWA representative listed on the last page stating the manual No. on the front page.

YASKAWA is not responsible for any modification of the product made by the user since that will void our guarantee.

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Ladder Editor 32 is a trademark of YASKAWA.

2. Software installation

Note
This chapter shows a general installation phase of any software. In this example the software FDDWIN is installed. Select the right software by choosing the appropriate software name.

2.1 Installation

There are three ways to start installation of this software, all will give the same result. The most common way is described below.

a) Put the first diskette named #1 in the disk-drive.

b) Click on the **Start** button on the menu-bar.

c) Choose **Run** from the menu.

d) Browse to drive **A:**

e) Choose the file named **SETUP.EXE**

f) Click **OK**.

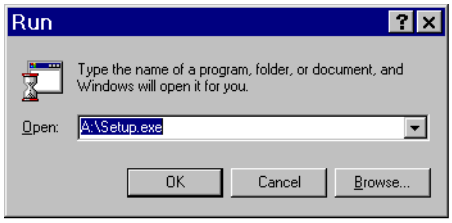


Fig.1 Choose installation file

g) Choose **OK** and the installation guide will start.

h) You can quit the installation att any time by clicking the **Cancel**-button and then confirm by **Yes**-button.

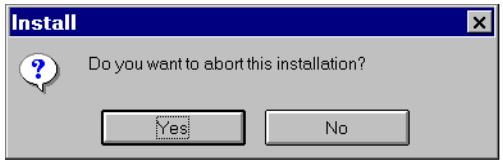


Fig.2 You can cancel installation at any time

i) Mark the language you want to use during installation. ***Note!*** This will not influence the language you use in FDDWIN32 later.

j) Click on the **OK**-button.

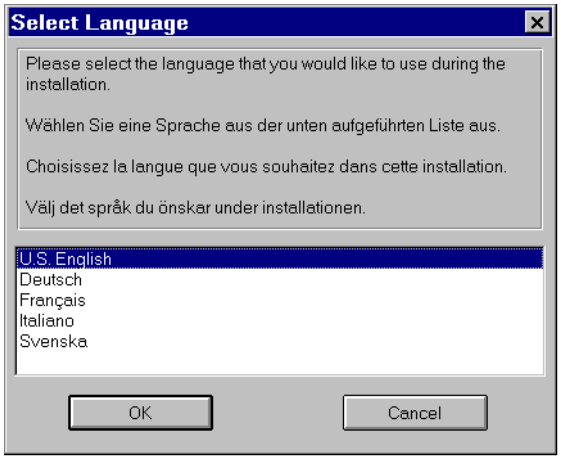

Select Language
Please select the language that you would like to use during the installation.
Wählen Sie eine Sprache aus der unten aufgeführten Liste aus.
Choisissez la langue que vous souhaitez dans cette installation.
Välj det språk du önskar under installationen.
U.S. English
Deutsch
Français
Italiano
Svenska
OK
Cancel

Fig.3 Language selection during installation

k) Pass this information screen by clicking the **Next**-button.

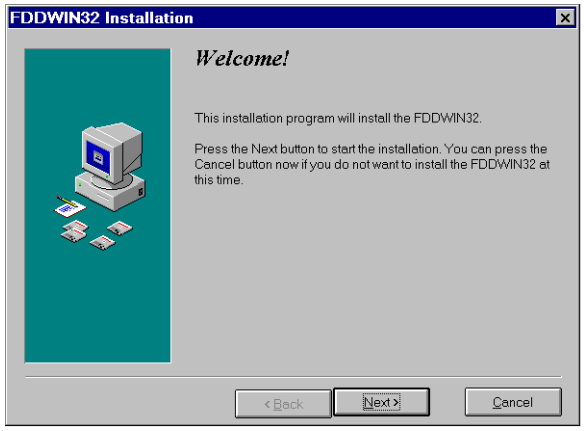

FDDWIN32 Installation
Welcome!
This installation program will install the FDDWIN32.
Press the Next button to start the installation. You can press the Cancel button now if you do not want to install the FDDWIN32 at this time.
< Back
Next >
Cancel

Fig.4 Information screen

l) Read through the license agreement and accept by clicking on the Next-button.

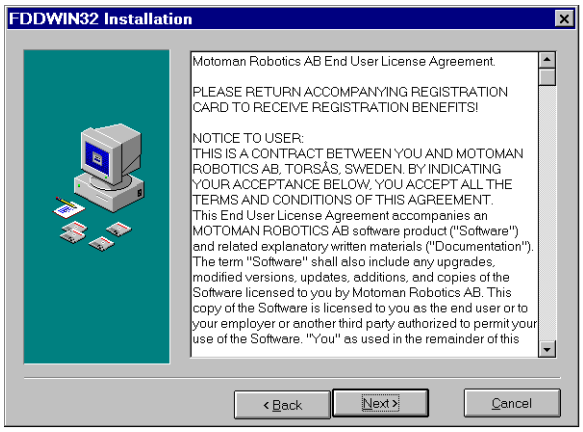

FDDWIN32 Installation
Motoman Robotics AB End User License Agreement.
PLEASE RETURN ACCOMPANYING REGISTRATION CARD TO RECEIVE REGISTRATION BENEFITS!
NOTICE TO USER:
THIS IS A CONTRACT BETWEEN YOU AND MOTOMAN ROBOTICS AB, TORSÅS, SWEDEN. BY INDICATING YOUR ACCEPTANCE BELOW, YOU ACCEPT ALL THE TERMS AND CONDITIONS OF THIS AGREEMENT.
This End User License Agreement accompanies an MOTOMAN ROBOTICS AB software product ("Software") and related explanatory written materials ("Documentation"). The term "Software" shall also include any upgrades, modified versions, updates, additions, and copies of the Software licensed to you by Motoman Robotics AB. This copy of the Software is licensed to you as the end user or to your employer or another third party authorized to permit your use of the Software. "You" as used in the remainder of this
< Back
Next >
Cancel

Fig.5 License agreement. Accept by clicking Next.

m) Set directory for FDDWIN32. It's advisable to install the software in the directory which is set as default by the installation guide.

n) Accept by clicking **Next**-button.

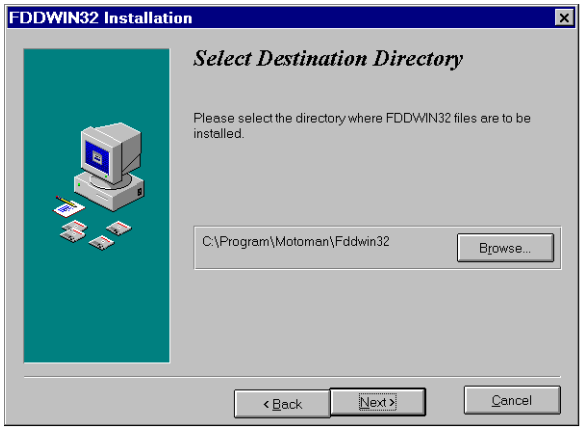


Fig.6 Choose directory

o) Accept installation process by clicking **Next**-button.

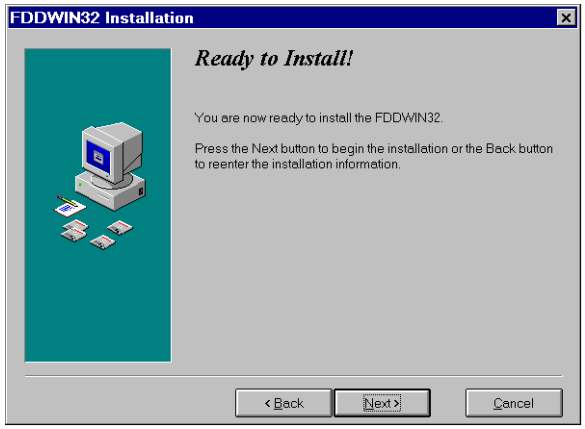

FDDWIN32 Installation
Ready to Install!
You are now ready to install the FDDWIN32.
Press the Next button to begin the installation or the Back button to reenter the installation information.
< Back
Next >
Cancel

Fig.7 Start installation

p) Installation starts.

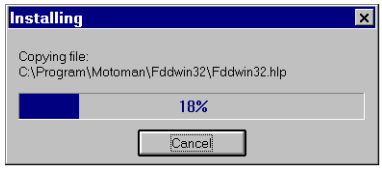


Fig.8 Installation progress counter

q) After some time you are told to enter disk #2/2.

r) Insert disk and click on OK-button.

Fig.9 Insert disk #2

s) The installation is finished and the last screen appears.

t) Accept installation by clicking the **Finish**-button.

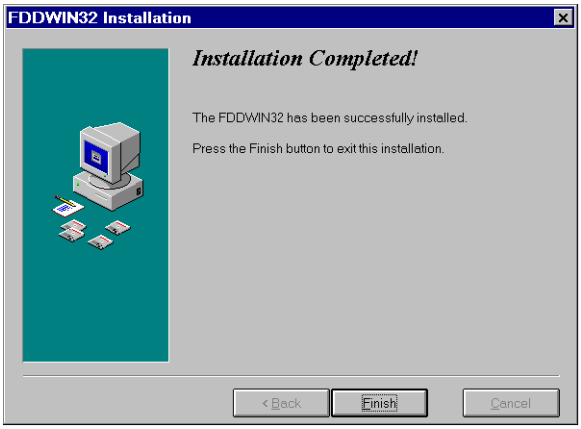


Fig.10 Installation complete

u) Before it is possible to run the software, the hardware key must be installed on the parallel port.

2.2 After installation

After installation, fill in and return the registration card to Motoman Robotics Europe AB.

During installation the main directory is automatically created and all necessary files are installed in the specified drive.

In the end of the setup a program group (MOTOMAN) and a icon is created. To start FDD for Windows just double-click on the **Start Menu**.

If you want to create a shortcut to FDDWIN32, see Windows manual for further information

2.3 Uninstall

As in all WIN95/NT softwares there are an uninstall facility if you want to remove the software from the hard disk.

a) Start the **Control panel** from the start menu. Select **Add/Remove** button from the menu.

b) Mark the line **FDDWIN32** from the menu.

c) Click **Add/Remove** button.

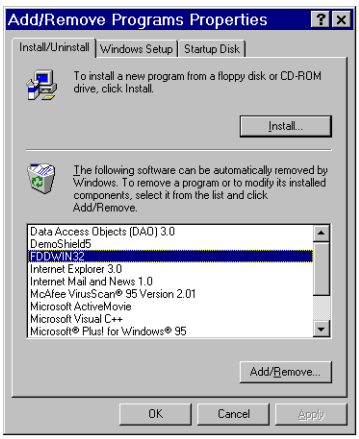

Add/Remove Programs Properties
Install/Uninstall
Windows Setup
Startup Disk
To install a new program from a floppy disk or CD-ROM drive, click Install.
Install...
The following software can be automatically removed by Windows. To remove a program or to modify its installed components, select it from the list and click Add/Remove.
Data Access Objects (DAO) 3.0
DemoShield5
FDDWIN32
Internet Explorer 3.0
Internet Mail and News 1.0
McAfee VirusScan® 95 Version 2.01
Microsoft ActiveMovie
Microsoft Visual C++
Microsoft® Plus! for Windows® 95
Add/Remove...
OK
Cancel
Apply

Fig.11 Mark the FDDWIN32 software

d) Activate uninstall guide by **Next**-button.

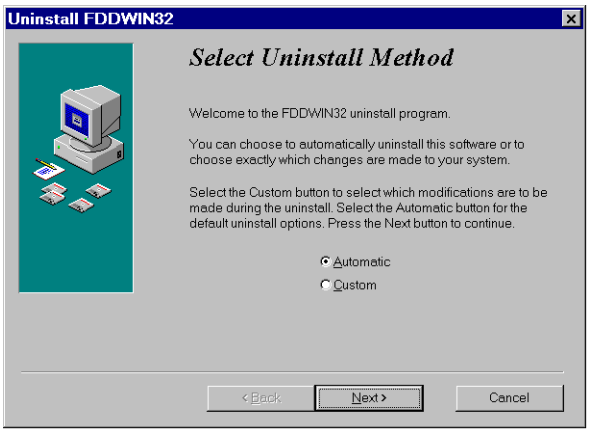

Uninstall FDDWIN32
Select Uninstall Method
Welcome to the FDDWIN32 uninstall program.
You can choose to automatically uninstall this software or to choose exactly which changes are made to your system.
Select the Custom button to select which modifications are to be made during the uninstall. Select the Automatic button for the default uninstall options. Press the Next button to continue.
Automatic
Custom
< Back
Next >
Cancel

Fig.12 Automatic uninstall

e) End the operation by clicking the **Finish**-button.

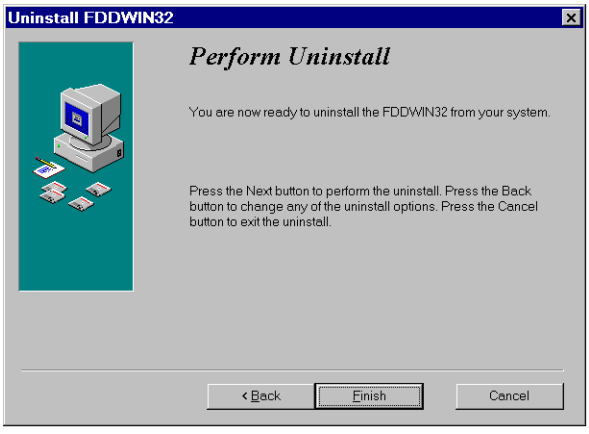

Uninstall FDDWIN32
Perform Uninstall
You are now ready to uninstall the FDDWIN32 from your system.
Press the Next button to perform the uninstall. Press the Back button to change any of the uninstall options. Press the Cancel button to exit the uninstall.
< Back
Finish
Cancel

Fig.13 Uninstall

3. Ladder editor 32 basic display

The following shows the "basic" display of Ladder Editor 32. The "basic" display is divided into two displays: "ladder preview" display and "ladder editing" display. Editing is available as referring to the ladder image before and after the ladder diagram in the editing line.

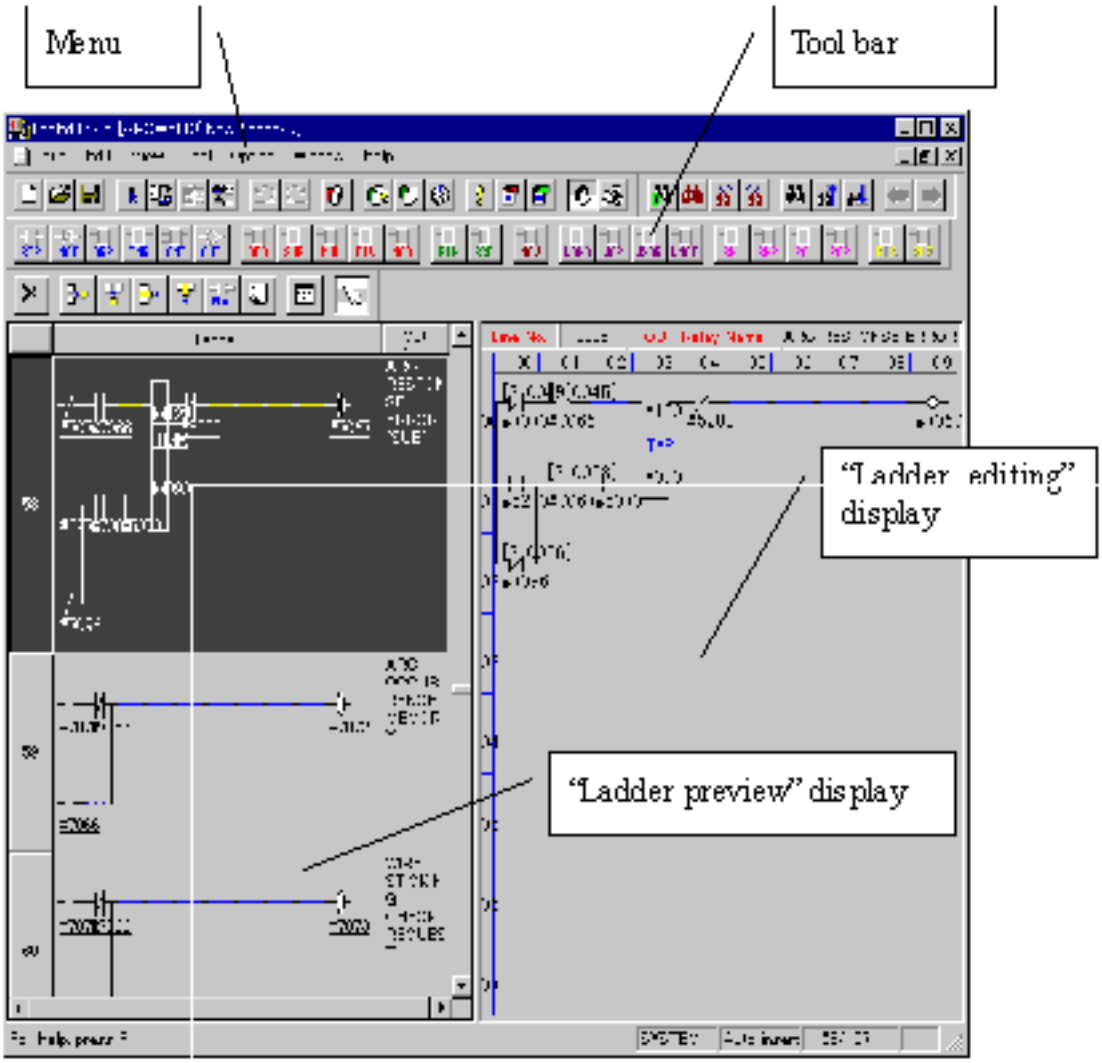


Fig.14 "Basic" Display

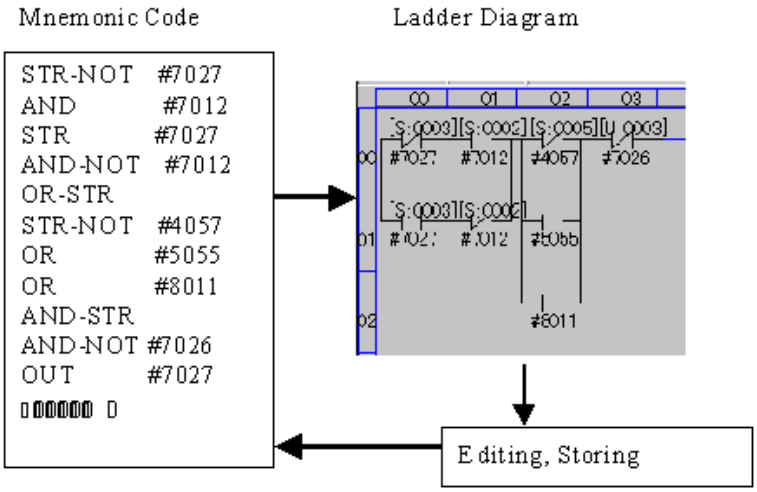
4. Specifications

4.1 Function

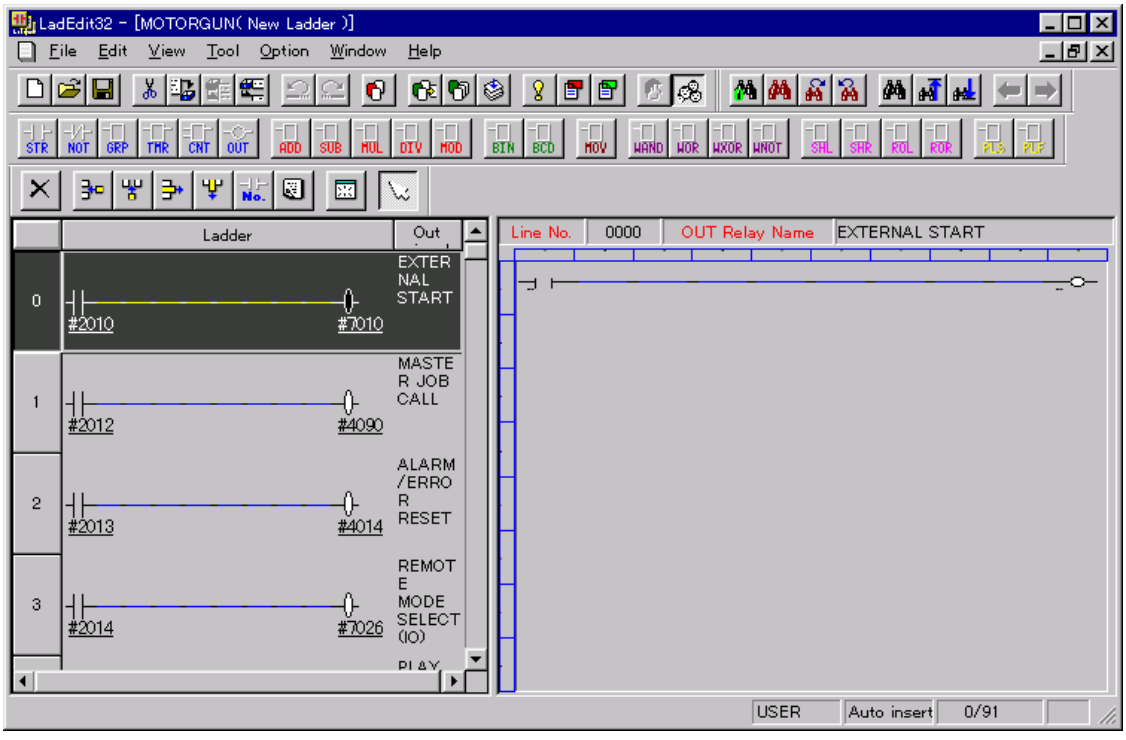
The robot controller (YASNAC XRC) has a concurrent I/O function that processes I/O related control independently from the manipulator, and in parallel with the manipulator operation. Ladder Editor 32 software is used to graphically display ladder programs with the above function as a signal connection diagram, or to edit commands by drag and drop operation using the mouse.

■ *Features of Ladder Editor 32*

✔ Ladder mnemonic code can be edited with an image of a ladder diagram.



✔ With the "ladder preview" display, the entire line of the ladder program can be easily previewed.



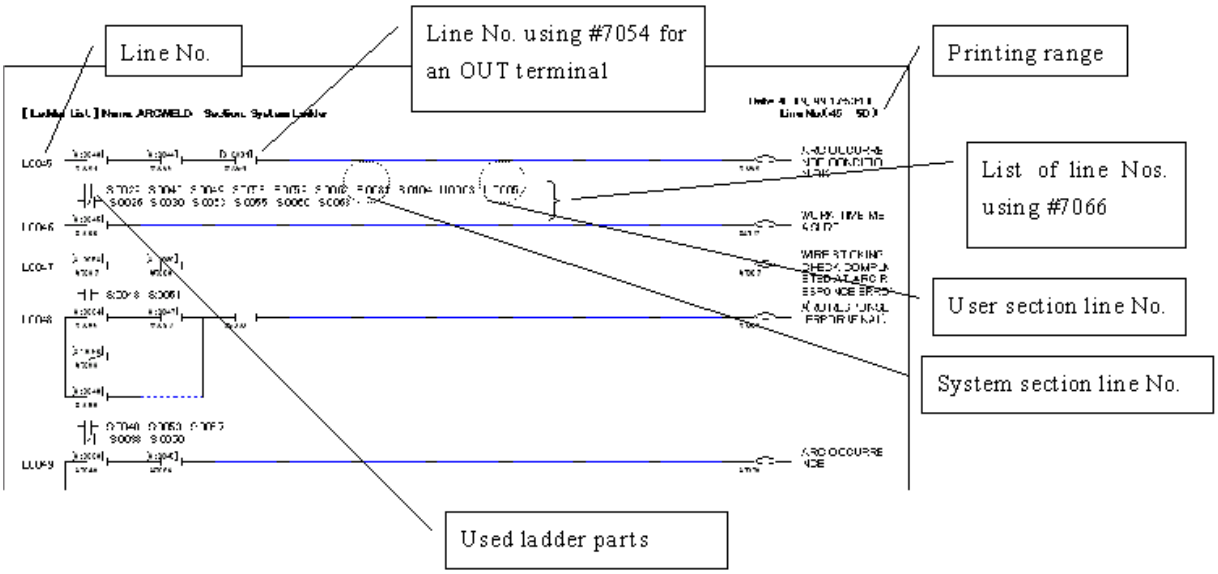
✔ Simple drag and drop operation can edit connections between ladder parts.

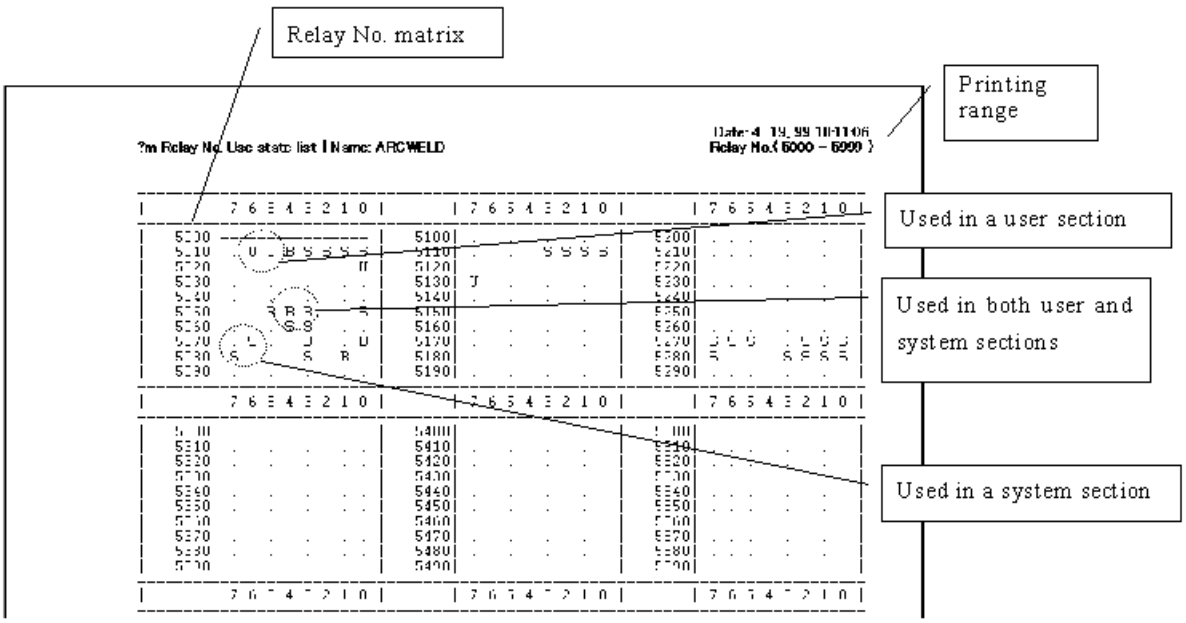
✔ The cross reference function is enriched. Information such as relay No. use state or the place where an arbitrary relay No. is used can be referenced easily.

✔ A history jump function is available. This function records the history of jumping to other lines, and easily returns to the previous line before jumping.

✔ A password function is available. Since ladder editing affects the system, this system has a user management option. The software can be set up to require a correct password to start up the software.

✔ The printing function is enriched. The cross referenced information and the ladder diagram can be printed. This function is useful when storing the ladder diagram as an output document.


Line No.
Line No. using #7054 for an OUT terminal
Printing range
List of line Nos. using #7066
User section line No.
System section line No.
Used ladder parts



4.2 Hardware configurations and software type

■ Hardware requirements

Ladder Editor 32 operates with the configurations shown below.

OS	Japanese Microsoft Windows 95 /98 /NT4.0*
Required Memory	16 Mbytes or more
CPU	Pentium or Pentium compatible processor
Hardware Disk Capacity for Installation	10 Mbytes or more
Disk Drive	Hard disk drive and CD-ROM drive
Display	Supported by MS-Windows
Mouse	Supported by MS-Windows
Robot Controller	YASNAC XRC
Hardware Lock Key	Used under single user registration. If a conversion adapter is required, refer to "Hardware Lock Key" for details.

Note!
This software is ladder editing software, not a ladder simulator.

The following devices or software are required when sending data between the XRC and the personal computer.

✔ The floppy disk drive exclusively used for the XRC, "YASNAC FC2"

✔ The personal computer communications software, "FC1 Emulator 32"

✔ The data transmission function between the personal computer communications software "MOTOCOM32" and the XRC

■ *Hardware lock key*

For correct operation, connect the attached hardware lock key to the personal computer.

Two types of hardware lock keys are available :

✔ Anphenole type

✔ D-sub type

Normally, a D-sub type hardware lock key is attached.

Connection when using a PC-AT compatible personal computer

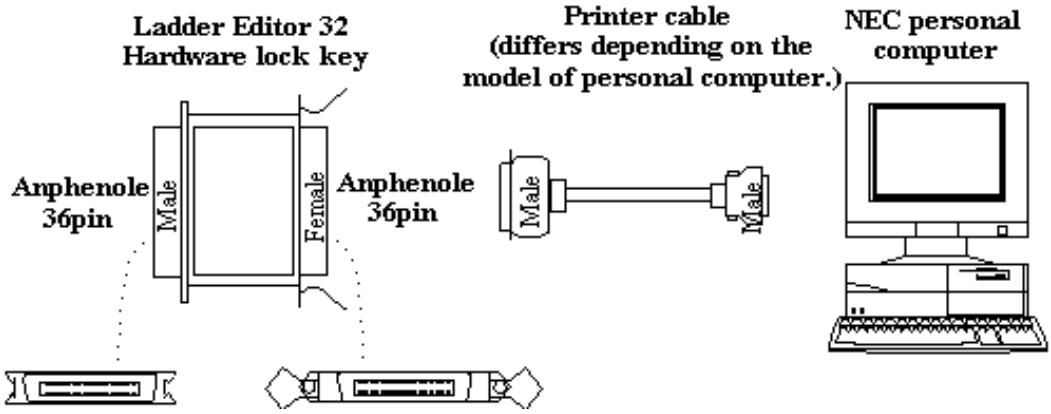
When using a PC-AT compatible personal computer such as a PC98-NX series NEC personal computer, connect the hardware lock key to the printer port.

Connection when using a personal computer other than PC-AT compatibles

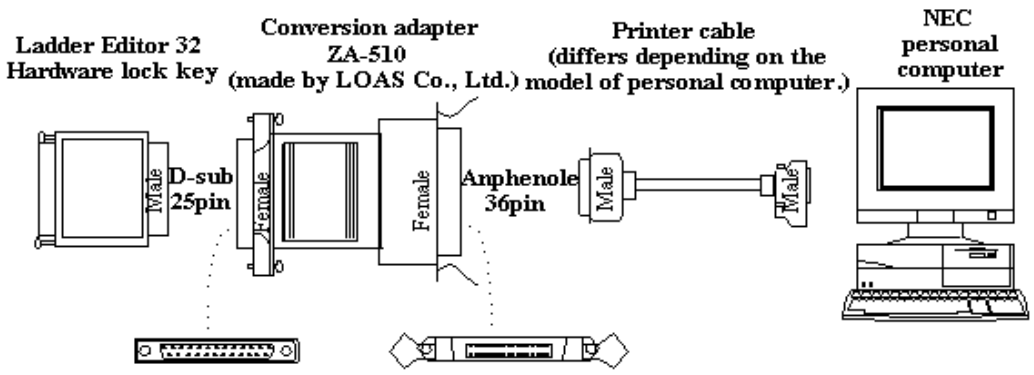
When using an anphenole type hardware lock key, the form of printer port differs depending on the computer model. Connect the key.

When using a D-sub type hardware lock key, install a conversion adapter between the printer port of the personal computer and the hardware lock key. The conversion adapter should be prepared by the customer.

■ *Anphenole type*



■ *D-sub type*

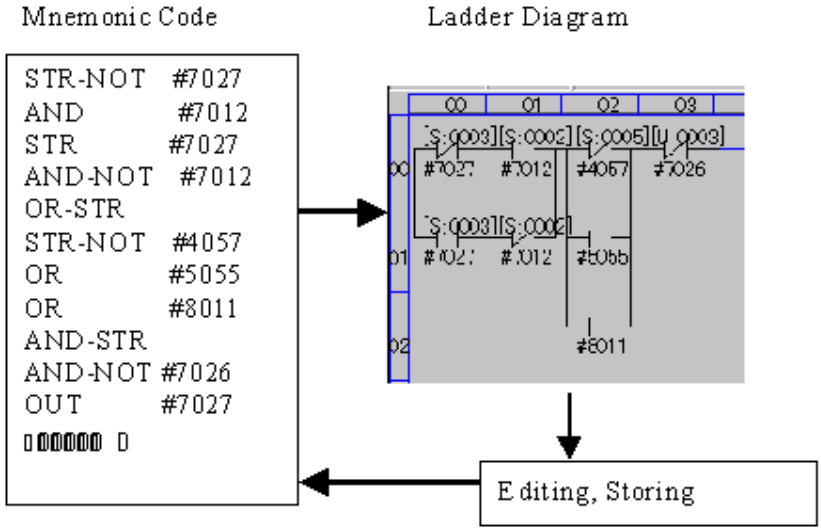


4.3 What is Ladder Editor 32?

The robot controller (YASNAC XRC) has a concurrent I/O function that processes I/O related control independently from the manipulator, and in parallel with the manipulator operation. Ladder Editor 32 software is used to graphically display ladder programs with the above function as a signal connection diagram, or to edit commands by drag and drop operation using the mouse.

■ *Features of Ladder Editor 32*

✔ Ladder mnemonic code can be edited with an image of a ladder diagram.

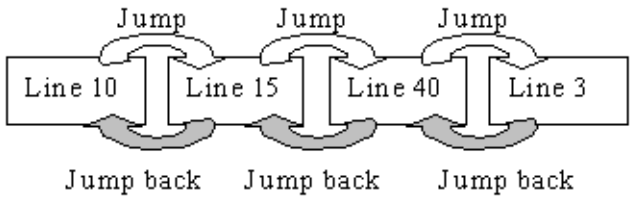


✔ With the "ladder preview" display, the entire line of the ladder program can be easily previewed.

✔ Simple drag and drop operation can edit connections between ladder parts.

✔ Cross reference function is enriched. Information such as relay No. use state or the place where an arbitrary relay No. is used can be referenced easily.

✔ History jump function is available. This function records the history of jumping to other lines, and easily returns to the previous line before jumping.



✔ Printing function is enriched. Cross reference information can also be printed, as well as ladder diagrams. This function is very useful when a created ladder is stored as reference material.

■ *Terms*

The following terms are frequently used in this manual.

Terms	Description
Ladder editor	Object of matrix composing a ladderprogram such as STR, TMR or GRP.
Set value	Value set to ladderparts such as relay numbers, register numbers or constants.
Line	One line indicates one section divided with OUT codes in a ladder memnemonic. Normally, there is one OUT part per line (excluding when GRP parts are used).

5. Default user name and password

■ *Default informations (for manager to store)*

The following table shows the default user names (user IDs) and passwords at log-ON that Ladder Editor 32 provides. "Managers" must store this information confidentially so that it will never be known to "Operators" or "Backup Operators".

Level Name	User Name	PassWord
Manager	Admin	00000000
Operator	User	0
Backup Operator	backup	None

6. Flowchart of basic editing

The following shows the basic flowchart of ladder editing.

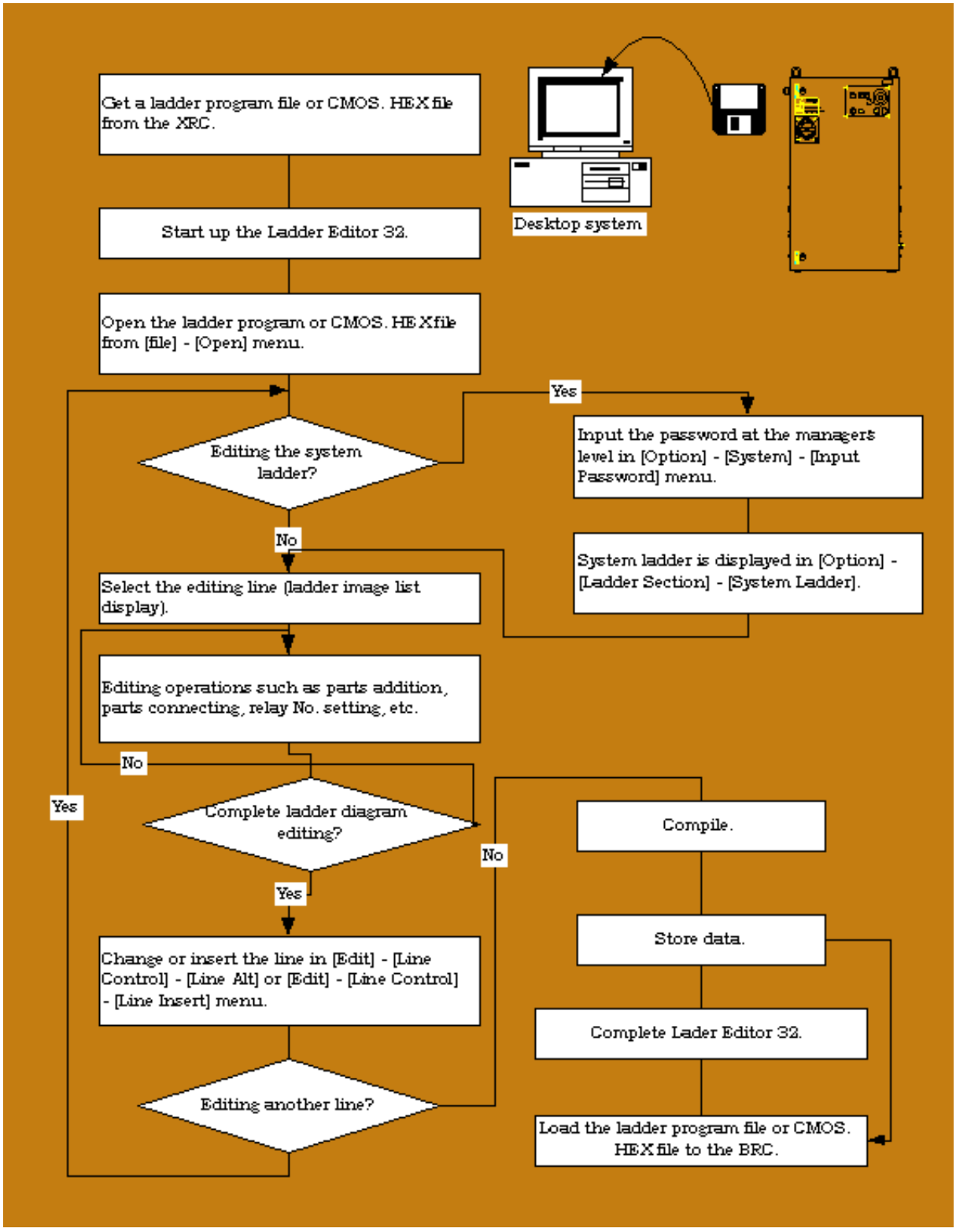

Get a ladder program file or CMOS. HEX file from the XRC.
Desktop system
Start up the Ladder Editor 32.
Open the ladder program or CMOS. HEX file from [file] - [Open] menu.
Yes
Editing the system ladder?
Input the password at the managers level in [Option] - [System] - [Input Password] menu.
No
System ladder is displayed in [Option] - [Ladder Section] - [System Ladder].
Select the editing line (ladder image list display).
Editing operations such as parts addition, parts connecting, relay No. setting, etc.
No
Yes
Complete ladder diagram editing?
No
Compile.
Yes
Store data.
Change or insert the line in [Edit] - [Line Control] - [Line Alt] or [Edit] - [Line Control] - [Line Insert] menu.
Complete Lader Editor 32.
Editing another line?
Load the ladder program file or CMOS. HEX file to the BRC.

Fig.15 Ladder Editing Operation Flow

7. Starting and ending Ladder Editor 32

7.1 How to start

To start up Ladder Editor 32, open the [Start] menu in the Windows tool bars, and select "Ladder Editor 32" from [Program] – [Motoman] – [Ladder Editor 32].

When this application is initially started up or when the [Manage type] is set to "Easy Mode", the [Input Password] dialog box for the Easy Mode (Fig. [Input Password] Dialog Box for Easy Mode) appears. When the [Manage type] is set to "Standard Mode", the [Input Password] dialog box for the Standard Mode (Fig. [Input Password] Dialog Box for Standard Mode) appears. (For details on managing user accounts, refer to "User information management".)

Fig.16 [Input Password] Dialog Box for Easy Mode

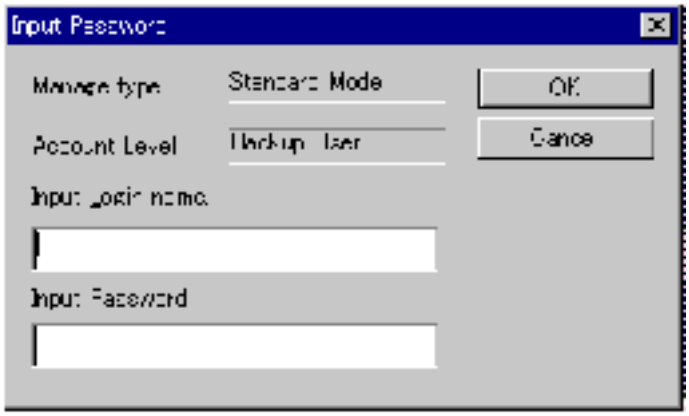


Fig.17 [Input Password] Dialog Box for Standard Mode

If the “Input Password at startup application” check box is cleared in the [User Manager] dialog box, these dialog boxes for inputting passwords do not appear.

The “Default User Names and Password List” managed and stored by the software administrator describes the “Login Name” and “Password”. This list is included with the shipment.

Input the password, and the “Startup” display for Ladder Editor 32 appears as shown in Fig. “"Startup" Display” appears.

.

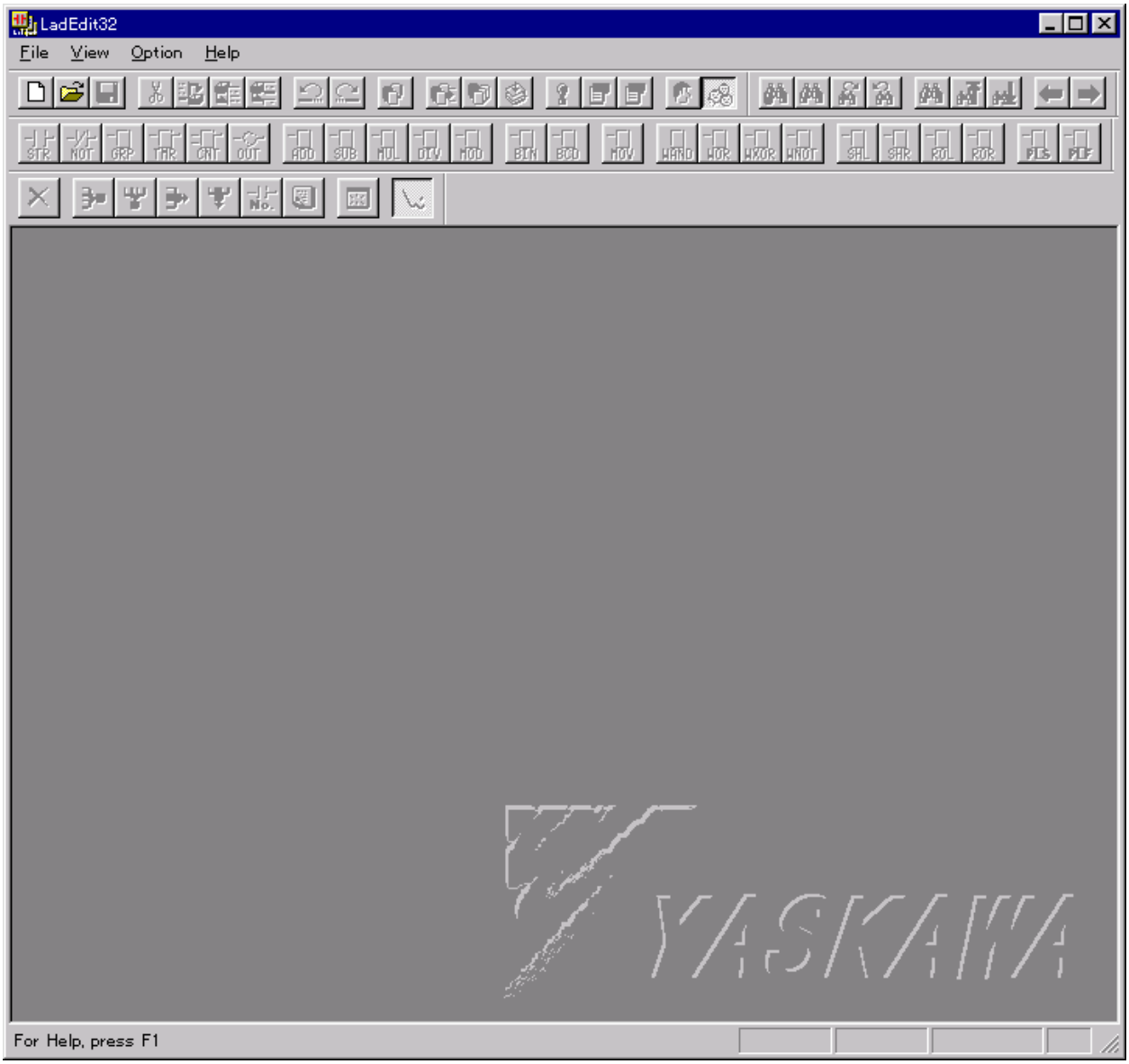


Fig.18 "Startup" Display

7.2 How to end

Selecting [File] – [Exit] in the Ladder Editor 32 menu can close the Ladder Editor 32.

Fig.19 Exit Menu

8. Reading and storing edited ladder files

8.1 Reading Ladder Data

To perform ladder editing, read in the ladder program to be edited by Ladder Editor 32.

The following two types of files can be edited by Ladder Editor 32:

✔ Ladder program file (text file)

✔ CMOS file (binary file)

How to operate

1) Selecting [File] – [Open] menu (or button) opens the [Open] dialog box.

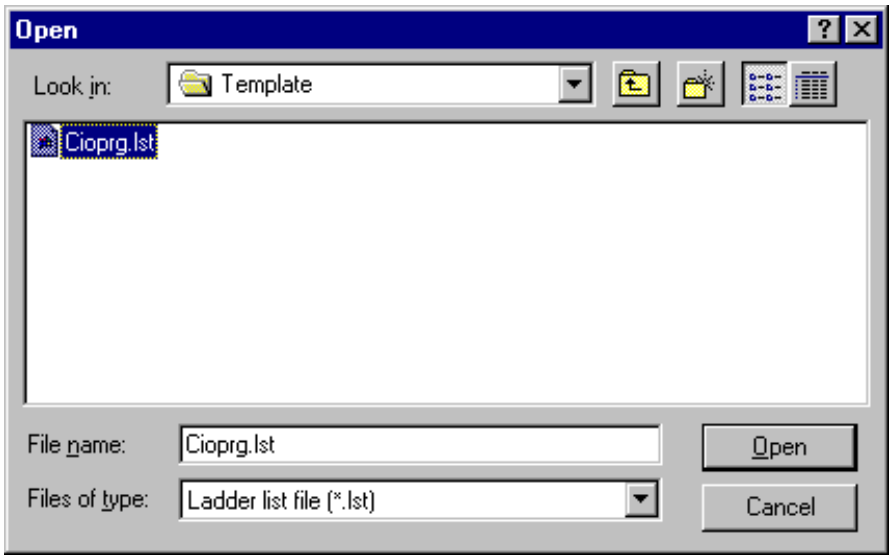


Fig.20 [Open] Dialog Box

2) To read in a ladder program file, select the ladder program file and click the [Open] button.
To read in a CMOS file, select "CMOS file (*.HEX)" from [Files of type] combo box in [Open] dialog box in Fig. "[Open] dialog box". When the list of CMOS. HEX files appears, select the CMOS file to be edited, and click the [Open] button.

8.2 Reading several ladder files

The Ladder Editor 32 is an MDI (Multi Document Interface) application to read in several ladder program files simultaneously. To select the ladder program to be edited, select the file name displayed in the [Window] menu, or select the window with the targeted ladder program among overlapped windows by selecting [Window] - [Cascade].

In addition, the targeted ladder program can also be selected where several editng windows are displayed and overlapped by selecting [Window] – [Cascade] menu.

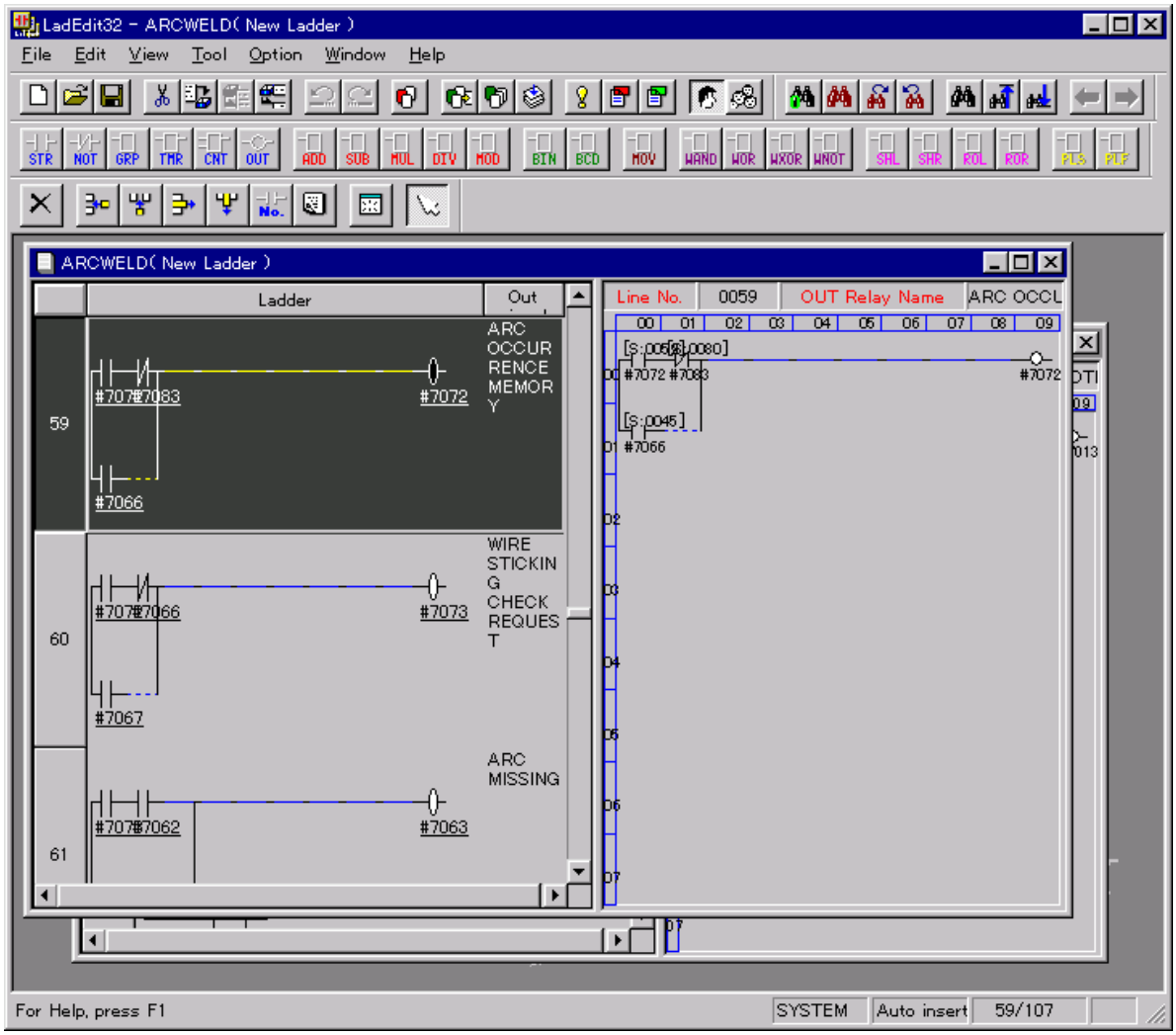


Fig.21 "Editing Window Overlapped" Display

8.3 Storing edited data

When ladder editing is completed, store the information in a file. **Before storing, compile the data when a ladder was edited by Ladder Editor 32.**
Unless compiled, data may not be stored completely.

How to Operate

1) Selecting [File] – [Save] stores the overwritten data on an existing file.

2) Selecting [File] – [Save As] displays the [Save As] dialog box. Set an arbitrary file name to the data to be stored.

To store the file, the following three types of file forms are available, depending on the method used to read in a file.

a) Storing when a Ladder Program File (CIOPRG.LST) is Open.
When a ladder program file is read in, only a ladder program file (text file) can be stored in an output file form.

b) Storing when a CMOS File (CMOS.HEX) is Open.
When a CMOS file is read in, the data can be stored in the two types of file forms, a ladder program file (text file) and a CMOS file (binary file), as an output file.

c) Storing a Ladder Program that is Being Edited.
A ladder program being edited cannot be stored if it has a detected error, even if compiled. The ladder program being edited can be stored as a work file. For details, refer to paragraph "Work File Forced Output Function".

9. Creating a ladder diagram

To create a new ladder program, use the standard ladder program as the base for editing. The standard ladder program is supplied as a template.

How to Operate

1) Selecting [File] – [New] displays the dialog box shown in fig.

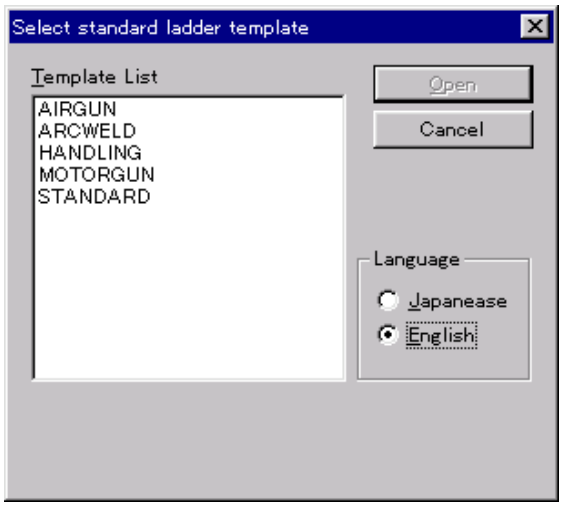


Fig.22 [Select standard ladder template] Dialog Box

2) Select the template to be set and click the [Open] button.

10. Editing a ladder diagram

All ladder diagrams are edited in the "Basic" Display shown in fig. ""Ladder Preview" display".

10.1 Ladder parts specifications

The Ladder Editor 32 supports the ladder parts corresponding to the new ladder codes employed for the XRC.

For the details on such ladder parts, refer to the [Ladder Parts Specifications] of [Help] menu.

10.2 Selecting a ladder edited line

A ladder diagram is edited in the "ladder editing" display, and the line to be displayed in the "ladder editing" display is selected in the "ladder preview" display (Fig. below). In the "ladder preview" display, images of the ladder diagrams of all the lines can be viewed set in the current ladder section (either system section or user section).

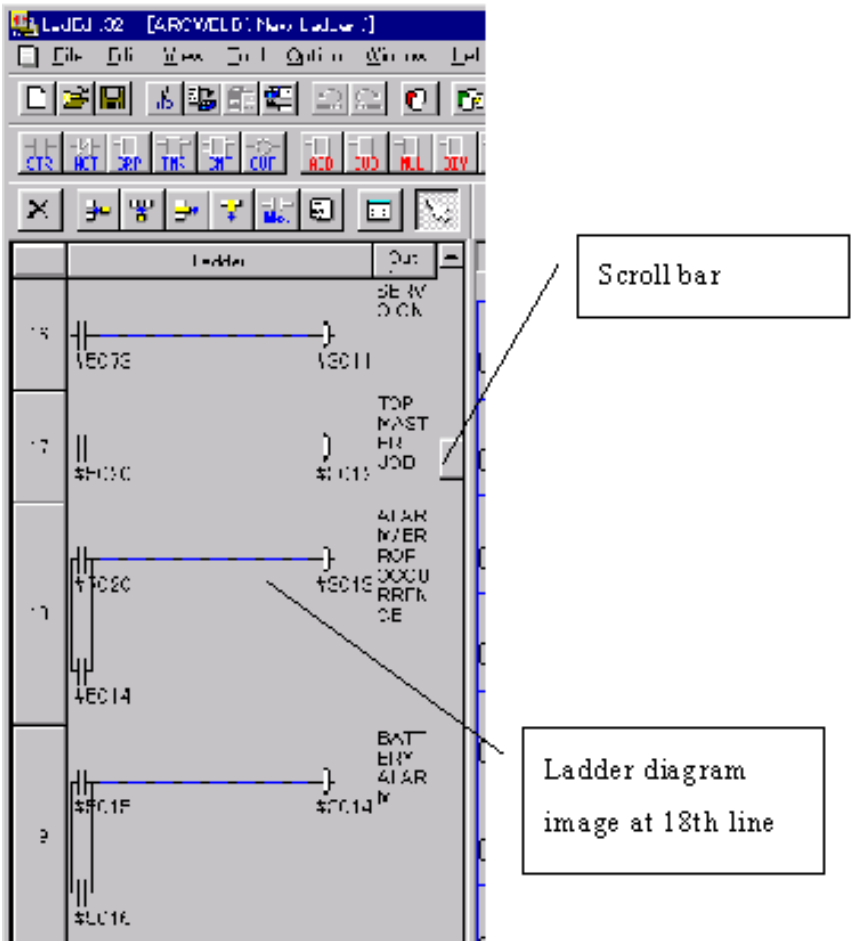


Fig.23 "Ladder preview" display

To refer to the ladder image of a line that is not displayed on the display, scroll using the scroll bar.

In the "ladder preview" display, right-click the mouse to select the line to be edited and the "ladder editing" display with the ladder diagram of the selected line will appear.

10.3 Adding new ladder parts

New ladder parts can be added when editing a ladder diagram.

Add ladder parts in the following manner.

How to operate

1) Enter the parts addition mode (select parts to be added).
Selecting [Tool] – [Parts] displays the list of ladder parts to be added. Then select the ladder parts. Or select the parts to be added from the ladder parts tool bar (refer to the paragraph "Ladder Parts Tool Bar").

✔ **Example)** Adding the ladder parts of the NC contact

Select [Tool] – [Parts] – [STR-NOT], or tool bar

.

2) Set new parts on the matrix to be added in the "ladder editing" display.
When the ladder parts to be added are determined, the mouse form changes in the "ladder editing" display. The selected ladder parts appear at the side of the mouse pointer. **Left-click** on the matrix location where the ladder parts are to be added.

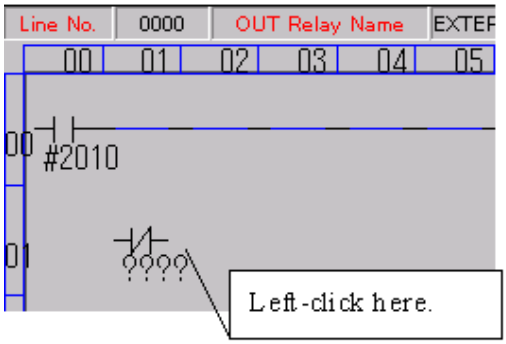


Fig.24 Addition of ladder parts

"????" may appear for the added ladder parts. This is because the relay No. or register No. is not set for these ladder parts, and it is not an error. Set the relay No. or register No.. For the setting of the relay Nos. or register Nos., refer to the paragraph "Setting Relay No., Register No. and Constants".

10.4 Deleting ladder parts

Delete the ladder parts in the following manner.

How to operate

1) Enter the parts deletion mode.
Select [Tool] – [Mode] – [Delete Parts], or select from the parts control tool bar (refer to "Parts Control Tool Bar").

2) Select the ladder parts to be deleted in the "ladder editing" display.
Left-click on the matrix location where the ladder parts are to be deleted in the "ladder editing" display.

10.5 Connecting and disconnecting lines between ladder parts

Ladder parts on a certain matrix are connected to ladder parts on another matrix with a line. The connection method of the line determines the ladder process. The following paragraph describes how to connect and disconnect the line between ladder parts.

10.5.A Connecting with a Line

Connect ladder parts with a line in the following manner.

How to operate

1) **Left-click** the mouse on the first ladder part.
2) While pressing the mouse, drag the mouse to the second ladder part.
3) Release the **left button** at the second ladder part.
   Two parts are connected by a drag and drop operation.

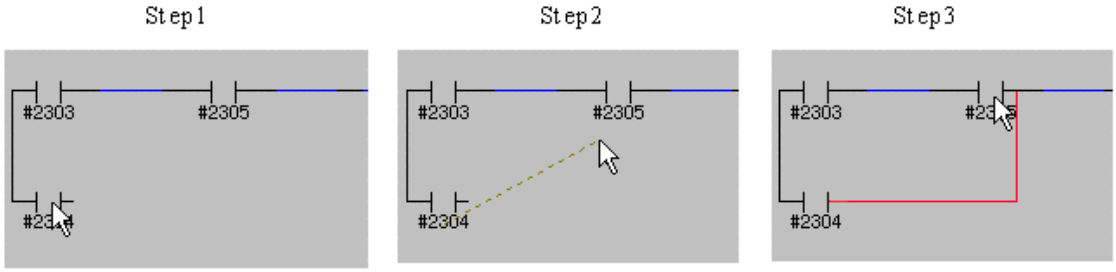


Fig.25 Line connection process

■ *Ladder parts connection terminals*

Ladder parts have IN and OUT terminals. A connecting line connects the IN and OUT terminals. A drop and drag operation determines which are IN and which are OUT terminals and connects them automatically.

However, when two connection ladder parts are placed vertically as shown in Fig. below, the user must decide to connect the IN or OUT side.

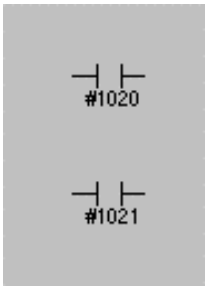


Fig.26 When parts are placed vertically

In Fig. "Connection on inside", the mouse pointer is dragged from the center of a ladder part and dropped on the IN side of the other part, to make the connecting line on the IN side.

Dropping on the IN side makes a line which connects to the IN side of the other ladder part. On the other hand, dropping on the OUT side makes a line which connects to the other OUT side.

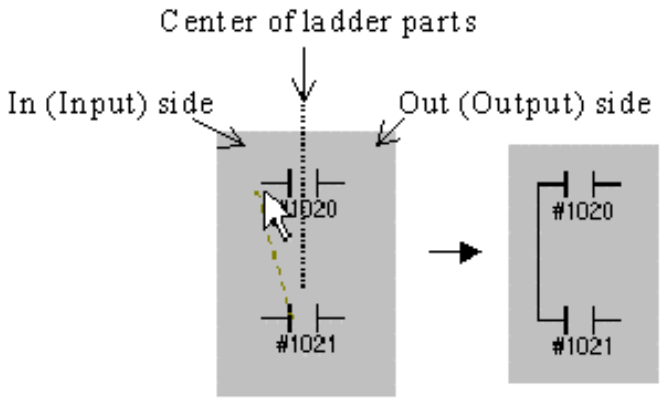


Fig.27 Connection on inside

10.5.B Disconnecting two parts

Erase the line between ladder parts to disconnect them in the following manner.

How to operate

1) Right-click the mouse on the first ladder part.

2) While pressing the mouse, drag the mouse to the second ladder part.

3) Release the **right button** at the second ladder part.
Two parts are disconnected by a right-click, drag and drop operation.

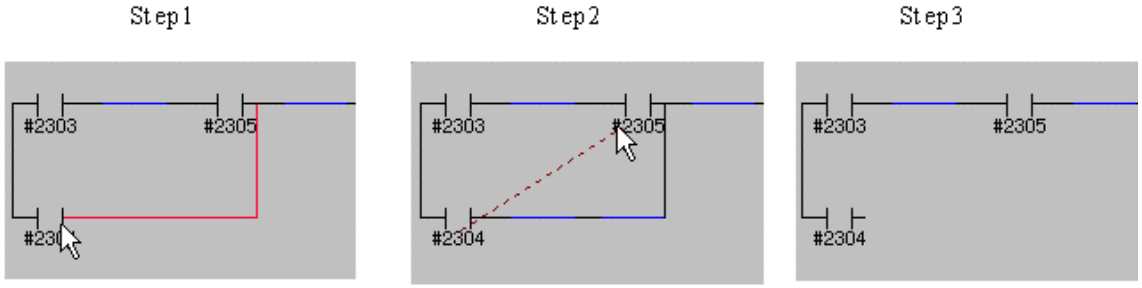


Fig.28 Disconnection Process

10.6 Setting relay no., register no. and constants

Relay No., register No. and constants can be set for each ladder parts. Set these values in the following manner.

How to operate

1) Enter the set value input mode.
Select [Tool] – [Mode] – [Input No.], or select No. from the parts control tool bar (refer to paragraph "Parts control tool bar").

2) Select the ladder parts to which the set values are input in the "ladder editing" display.
Left-click the mouse on the ladder parts in the "ladder editing" display, and the "set value input" dialog box appears.

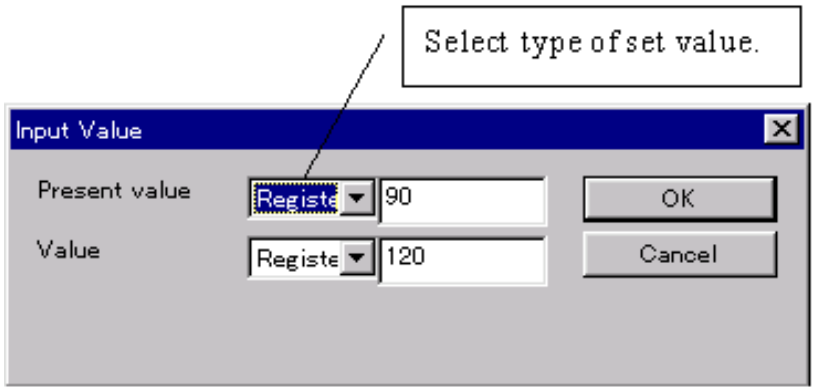


Fig.29 [Input Value] Dialog Box

Note!
The number of setting items in the [Input Value] dialog box differs depending on the ladder parts.

3) Input the set values.
Select the type of the set value in the combo box of the [Input Value] dialog box, and then input a value suitable for the type of the set value.
Click the [OK] button to set the values.

■ *Setting Values Using a Pop-up Menu*

Set values can also be set in the following manner using a pop-up menu. The pop-up menu appears by right-clicking the mouse.

How to operate

1) Right-click the mouse on the ladder parts to which the set values are input, and select the pop-up menu.
Right-click the mouse on the ladder parts to which the set values are input in the "ladder editing" display, and the pop-up menu appears. Select the [Input No.], and the [Input Value] dialog box appears.

2) Input the set values.
Input the set values in the [Input Value] dialog box.

10.7 Inputting relay no. and register no. names

Names can be set for the relay Nos. and register Nos.. When editing name, a new name can be input or name information read from the external name file can be edited. Set the name for a relay No. or a register No. in the following manner.

How to operate

1) Enter the name input mode.
Select [Tool] – [Mode] – [Input Relay Name], or select from the parts control tool bar (refer to "Parts control tool bar").

2) Select the ladder parts where the number of the name to be selected is set.
Left-click the mouse on the ladder parts where the number of the name to be selected is set in the "ladder editing" display, and the [Input name] dialog box appears.

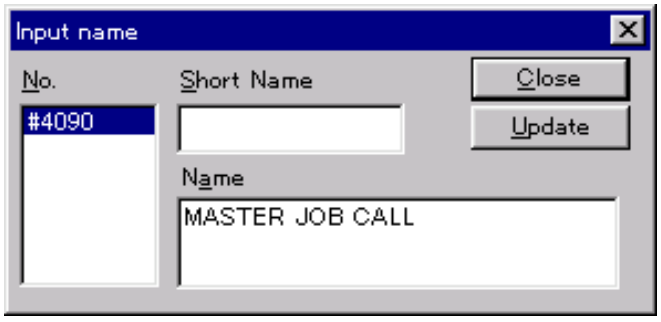


Fig.30 [Input name] Dialog Box

The relay No. or register No. appears in the No. selection list box as shown below.

✔ Relay No. : #xxxx, W#xxxx

✔ Register No. : Mxxx

Note!
Some ladder parts have several relay Nos. or register Nos. In such a case, several numbers appear in the No. selection list box.

Verify that the targeted relay Nos. or register Nos. appear and are selected in the relay No. selection list box.

3) Set the name.
Two types of names, a short name and a long name can be used. They are treated as follows with Ladder Editor 32.

Short name:	Appears overlapped on the relay No. or register No. of the ladder diagram in the "ladder editing" display. (Refer to "Switching short name display/non-display".)
Long name:	Appears in the column of OUT relay names in the "ladder editing" display, and in the row of output signal names in the "ladder preview" display.

When setting is completed, be sure to click the [Update] button. This button records the setting information.

■ *Setting names using a pop-up menu*

Names can be also set in the following manner using the pop-up menu.

How to operate

1) Select the ladder parts where the relay No. or register No. of the name to be edited is set.
Right-click the mouse on the ladder parts where the relay No. or register No. of the name to be edited is set in the "ladder editing" display, and the pop-up menu appears. Select the [Input Name], the [Input name] dialog box appears.

2) Edit the name.
Edit the displayed name for a relay No. or register No. in the [Input name] dialog box.

10.8 Inserting editing matrix row and line

Even though new ladder parts are to be inserted immediately before the ladder parts that have already been set, there may be no matrix for insertion as shown in the following diagram.

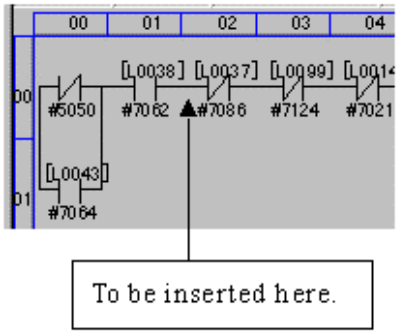


Fig.31 When no space for matrix

In this case, insert a line (or a row) to secure the matrix where the ladder parts are to be inserted.

10.8.A Inserting a row

Insert a row in the following manner.

How to operate

1) Enter the row insertion mode.
Select [Tool] – [Mode] – [Row control] – [Insert Row].

Or select from the parts control tool bar (refer to "Parts Control Tool Bar").

2) Specify the matrix where a row is to be inserted.
Left-click the mouse on the matrix where a row is to be inserted.

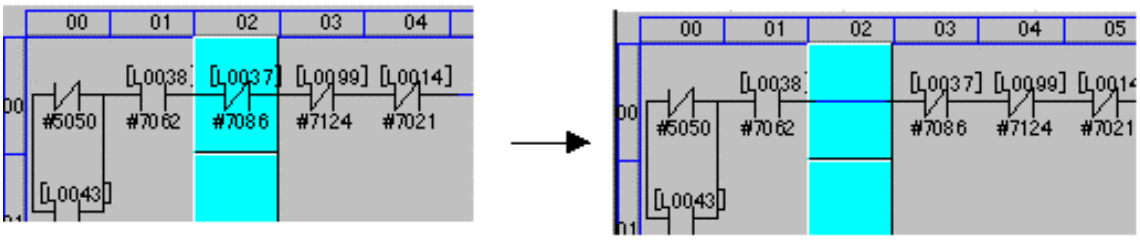


Fig.32 Result of Row Insertion

■ *Row insertion disabled pattern*

A row cannot be inserted if even one part exists in the column just before the last column on the right after the second line of the matrix in the "ladder editing" display.

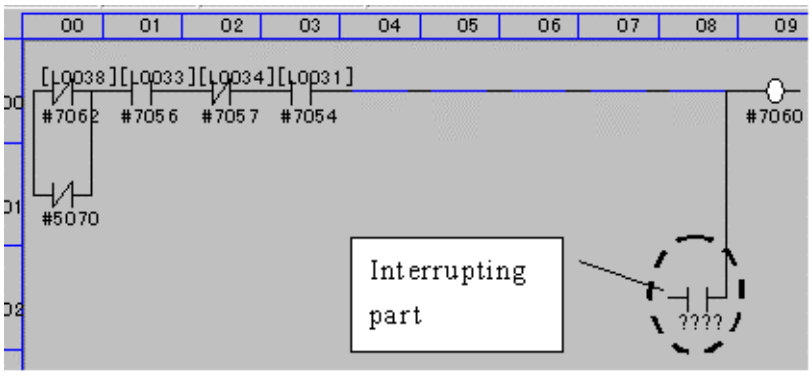


Fig.33 Disabled row insertion

10.8.B Inserting a Line

Insert a line in the following manner.

How to operate

1) Enter the line insertion mode.
Select [Tool] – [Mode] – [Column control] – [Insert Column].

Or select from the parts control tool bar (refer to "Parts Control Tool Bar").

2) Specify the matrix where a line is to be inserted.
Left-click the mouse on the matrix where a line is to be inserted.

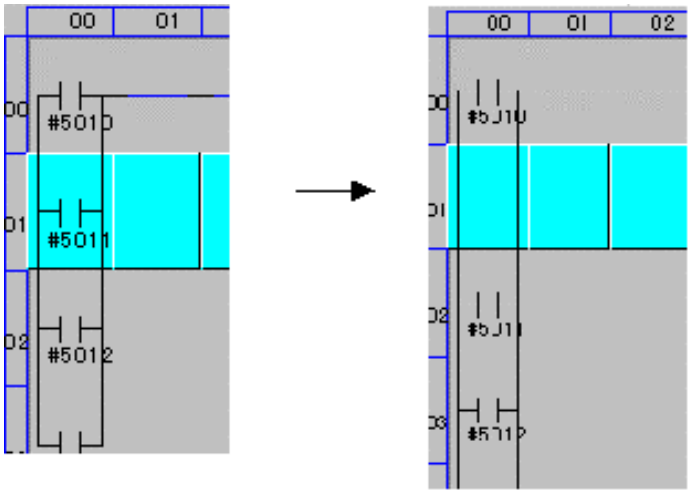


Fig.34 Result of line insertion

■ *Line insertion disabled pattern*

A line cannot be inserted if even one part exists in the lowest line of the matrix in the "ladder editing" display.

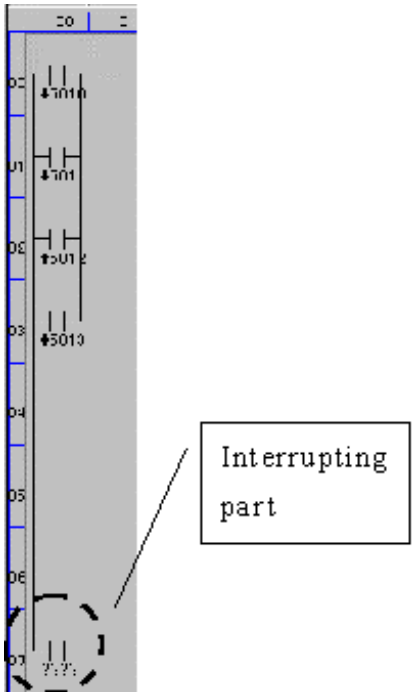


Fig.35 Disabled line insertion

10.9 Deleting Editing Matrix Row and Line

Unnecessary rows or lines can be deleted.

10.9.A Deleting a Row

Delete a row in the following manner.

How to operate

1) Enter the row deletion mode.
Select [Tool] – [Mode] – [Row control] – [Delete Row].

Or select from the parts control tool bar (refer to "Parts control tool bar").

2) Specify the matrix where a row is to be deleted.
Left-click the mouse on the matrix where a row is to be deleted.

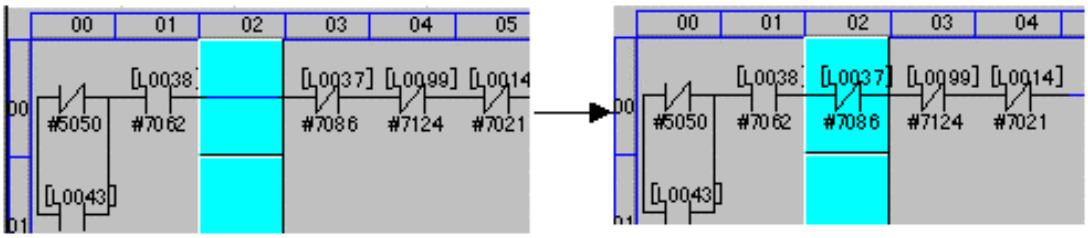


Fig.36 Result of row deletion

Note!
Deletion of a row deletes all the ladder parts that are set to the row to be deleted.

10.9.B Deleting a Line

Delete a line in the following manner.

How to operate

1) Enter the line deletion mode.
Select [Tool] – [Mode] – [Column control] – [Delete column].

Or select from the parts control tool bar (refer to "Parts control tool bar").

2) Specify the matrix where a line is to be deleted.
Left-click the mouse on the matrix where a line is to be deleted.

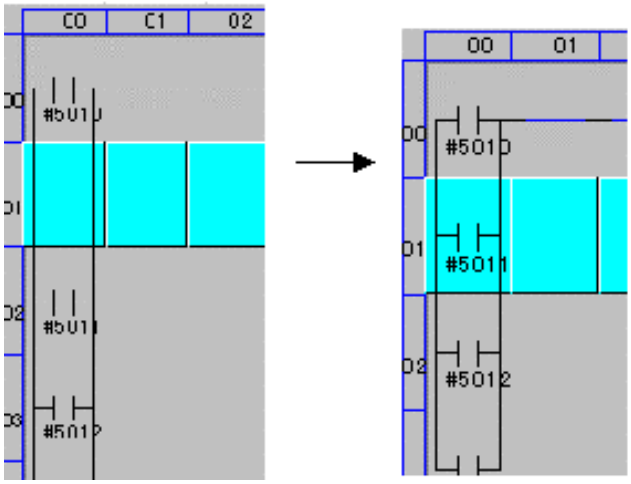


Fig.37 Result of line deletion

Note!
Deletion of a line deletes all the ladder parts set to the line to be deleted.

10.10 Clearing Displays

The contents of the "ladder editing" display can be cleared when editing. This function is useful when the current display is to be reedited from the beginning.

How to operate

Select [Edit] – [Clear]. Or select from the parts control tool bar (refer to " Parts Control Tool Bar").

11. Inserting a new line

A new line is inserted into an arbitrary line. Since default values are set to the new line, change the values to the correct ladder information.

The new line is inserted into the next line of the line selected in the ladder preview display.

How to operate

1) Select [Edit] – [Insert new line], or select from the main tool bar (refer to "Main tool bar").

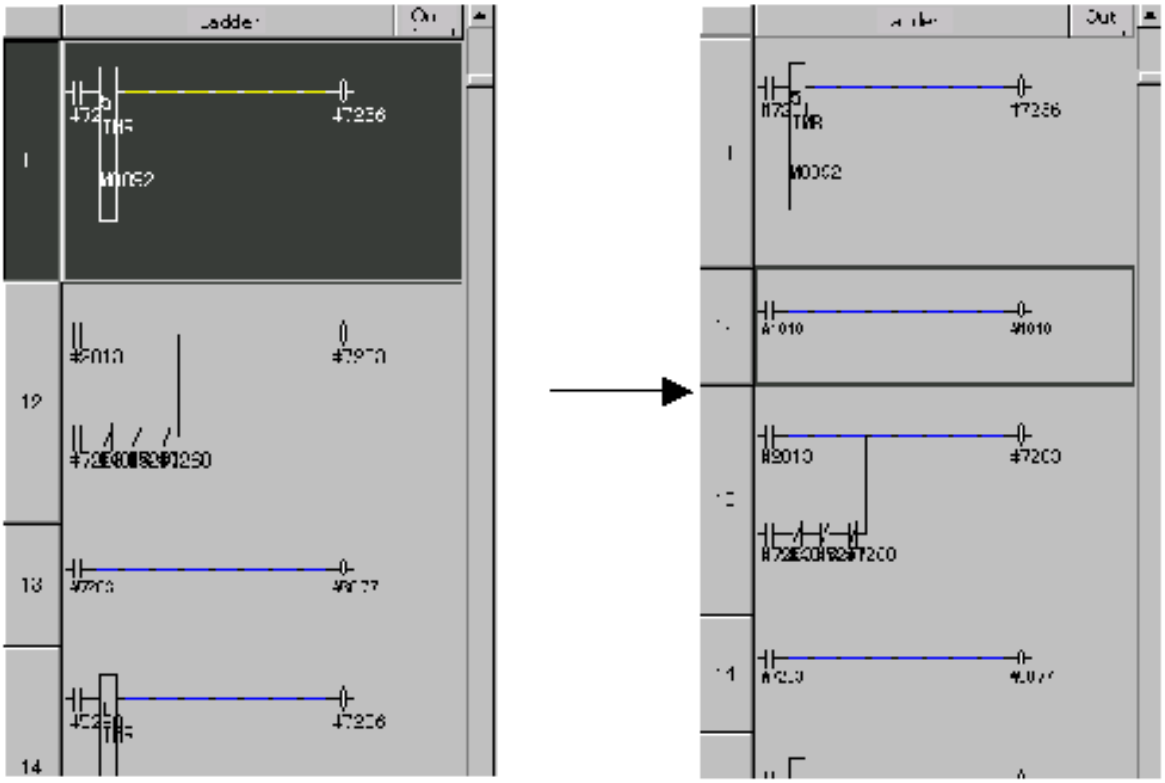


Fig.38 Inserting new line

12. Line operation of ladder diagram

Be sure to select [Line Alt] or [Line Insert] for the contents edited in the "ladder editing" display before editing another line. Without this operation, the contents edited immediately before will be deleted. Ladder Editor 32 checks the ladder information that is being currently edited when another line appears. If the [Line Alt] or [Line Insert] is not selected, an editing confirmation message appears. (Refer to "Automatic updating function".)

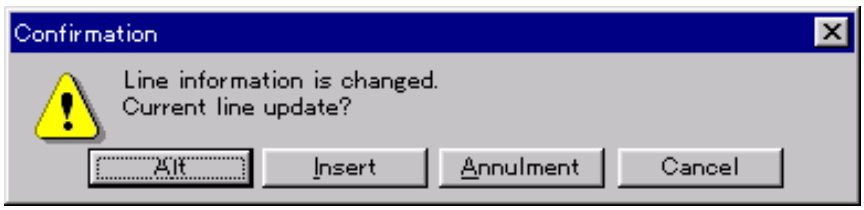


Fig.39 [Confirmation] Dialog Box

Normally, the operator uses the menu or tool button to perform [Line Alt] or [Line Insert].

12.1 Changing an edited ladder line

Overwrite the contents edited in the "ladder editing" display on the line currently being edited, in the following manner.

How to operate

1) Select [Edit] – [Line control] – [Line Alt], or select from the main tool bar (refer to "Main tool bar").

12.2 Inserting an Edited Ladder Line

Insert the contents edited in the "ladder editing" display into the next line of the line currently being edited, in the following manner. Therefore, the ladder data after the inserting line will be shifted backward.

How to operate

1) Select [Edit] – [Line control] – [Line Insert], or select from the main tool bar (refer to "Main tool bar").

13. Cutting, copying and pasting lines

13.1 Cutting a ladder diagram line

Cut the line selected in the "ladder preview" display. The ladder information of the cut line can be pasted to another line by pressing [Paste] or [Insert/Paste].

How to operate

1) Select the line to be cut in the "ladder preview" display, and select [Edit] – [Cut]. Or select from the main tool bar (refer to "Main tool bar").

2) To select several lines simultaneously, hold down the [SHIFT] or [CTRL] key when selecting lines.

13.2 Copy a ladder diagram line

Copy the line selected in the "ladder preview" display.
The ladderinformationof the copied line can be pasted onto another line by pressing [Paste] or [Insert/Paste].

How to operate

1) Select the line to be copied in the "ladder preview" display. Then select [Edit] – [Copy] menu. Or select from the main tool bar (refer to “Main tool bar").

2) To select several lines simultaneously, hold down the [SHIFT] or [CTRL] key when selecting lines.

13.3 Pasting a ladder diagram line

Paste the cut or copied contents of the line by pressing [Cut] or [Copy] over the line selected in the "ladder preview" display.

When several ladder list files are open simultaneously, the ladder diagram can be pasted onto another ladder list file.

How to operate

Select the line to be pasted in the "ladder preview" display, and select [Edit] – [Paste]. Or select from the main tool bar (refer to "Main tool bar").

Note!
This function is disabled if several lines were cut or copied by pressing [Cut] or [Copy] in the operation immediately before. After selecting only one line and pressing [Cut] or [Copy], try pasting again.

13.4 Inserting and pasting a ladder diagram line

Insert the cut or copied contents of the line into the line selected in the "ladder preview" display. Therefore, the ladder data after the inserting/pasting line will be shifted backward.

When several ladder list files are open simultaneously, the ladder diagram can be inserted and pasted onto another ladder list file.

How to operate

1) Select the line to be inserted and pasted in the "ladder preview" display. Then select [Edit] – [Insert Paste]. Or select from the main tool bar.
(Refer to "Main tool bar").

14. Compiling edited contents

Be sure to compile the ladder information of each line after editing.

Compiling performs final checking such as the relay No. overlapping check, etc. to load the information to the controller.

How to operate

Select [Edit] – [Compile], or select from the main tool bar.
(Refer to "Main Tool Bar").

Note!
Without this operation, the edited data cannot be correctly stored.

Since compiling processes the system section and the user section of the ladder program, it is unnecessary to change to a system ladder or a user ladder.

15. Printing

15.1 Printing a ladder diagram

Print an image of a ladder diagram. For the ladder program to be printed, the line Nos. of other lines referring to the OUT terminal relay Nos. appear.
The information of the reference lines appears as the system section and user section together.

How to Operate

1) Select [File] – [Print] – [Ladder Image] – [System Ladder (or User Ladder)].

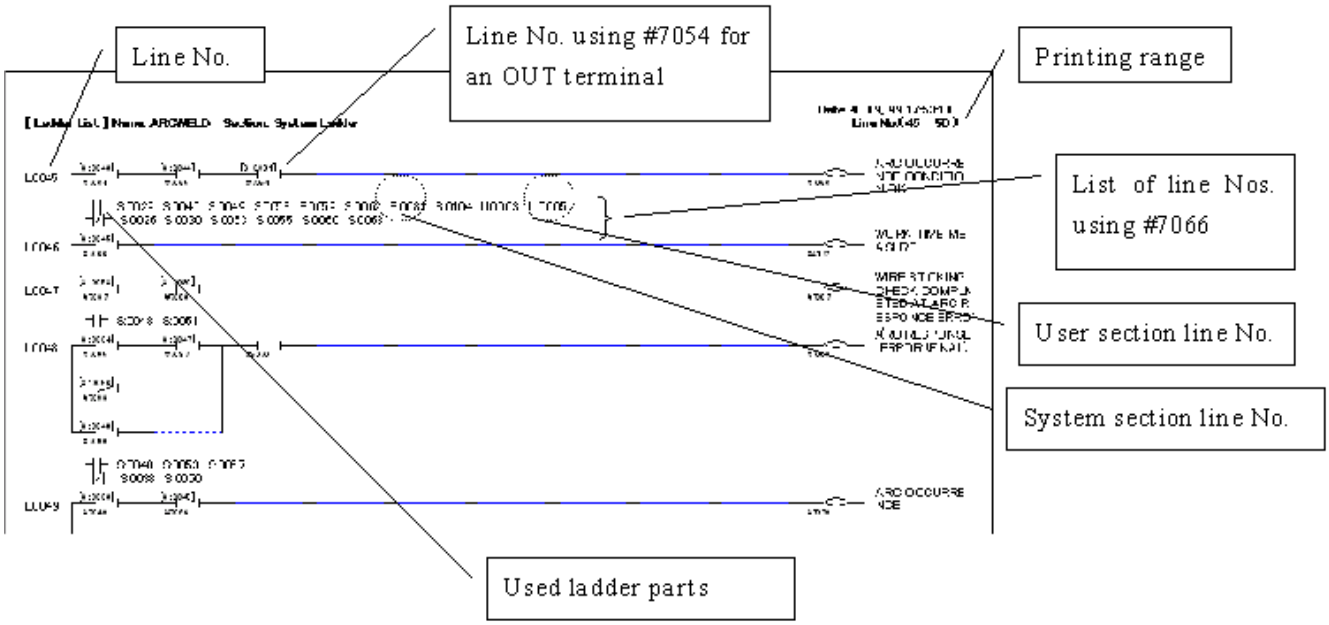

Line No.
Line No. using #7054 for an OUT terminal
Printing range
List of line Nos. using #7066
User section line No.
System section line No.
Used ladder parts

Fig.40 Ladder image printing

15.2 Printing relay no. using list

Print the list of used relay Nos. and the line Nos. referring to each relay No. in a list. List information of the reference lines appears as the system section and user section together.

How to operate

1) Select [File] – [Print] – [Relay No. use line list] – [System Ladder (or User Ladder)].

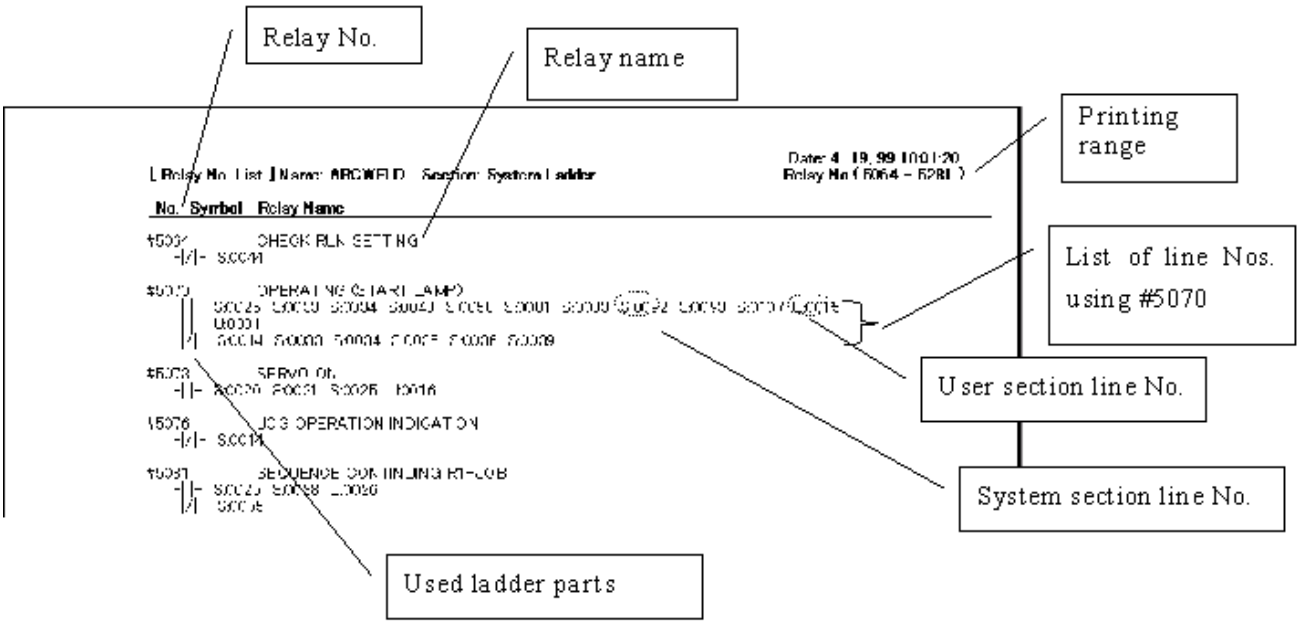


Fig.41 Printing relay no. list

15.3 Printing register no. using list

Print the list of used register Nos. and line Nos. referring to each register No. in a list. List information of the reference lines appears as the system section and user section together.

How to Operate

1) Select [File] – [Print] – [Register No. use line list] – [System Ladder (or User Ladder)].

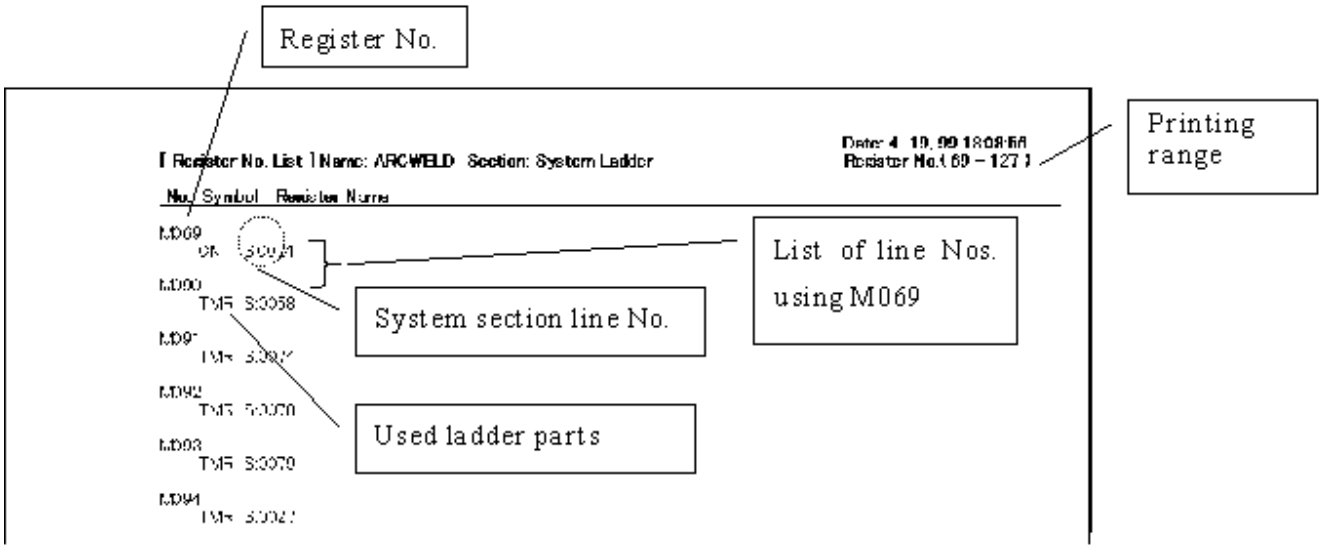


Fig.42 Printing register no. list

15.4 Printing relay no. use state

Print the relay No. use state in the "matrix" display.

How to Operate

1) Select [File] – [Print] – [Relay No. use state].
Relay Nos. for the system section and user section appear together, indicated by the following symbols.

✔ S: Relay Nos. used in a system section

✔ U: Relay Nos. used in a user section

✔ B: Relay Nos. used in both system and user sections

2) A relay No. in a matrix is regarded as YYYYX when the vertical is "YYYY" and the horizontal axis value is "X".

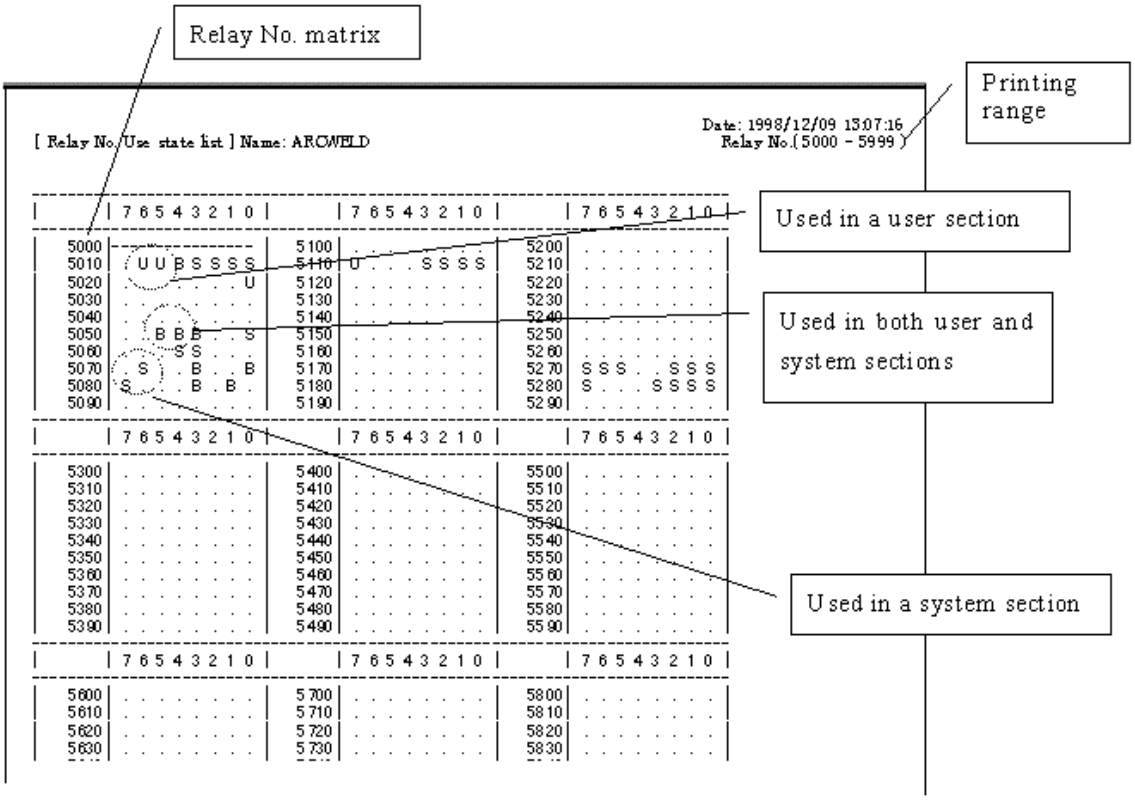

Relay No. matrix
Printing range
[Relay No./Use state list] Name: AROWELD
Date: 1998/12/09 13:07:16
Relay No.(5000 - 5999)
Used in a user section
Used in both user and system sections
Used in a system section

Fig.43 Printing relay no. use state

15.5 Printing User Alarms and User Messages

Print the lists of user alarms and user messages.

How to operate

1) Select [File] – [Print] – [User alarm user message].

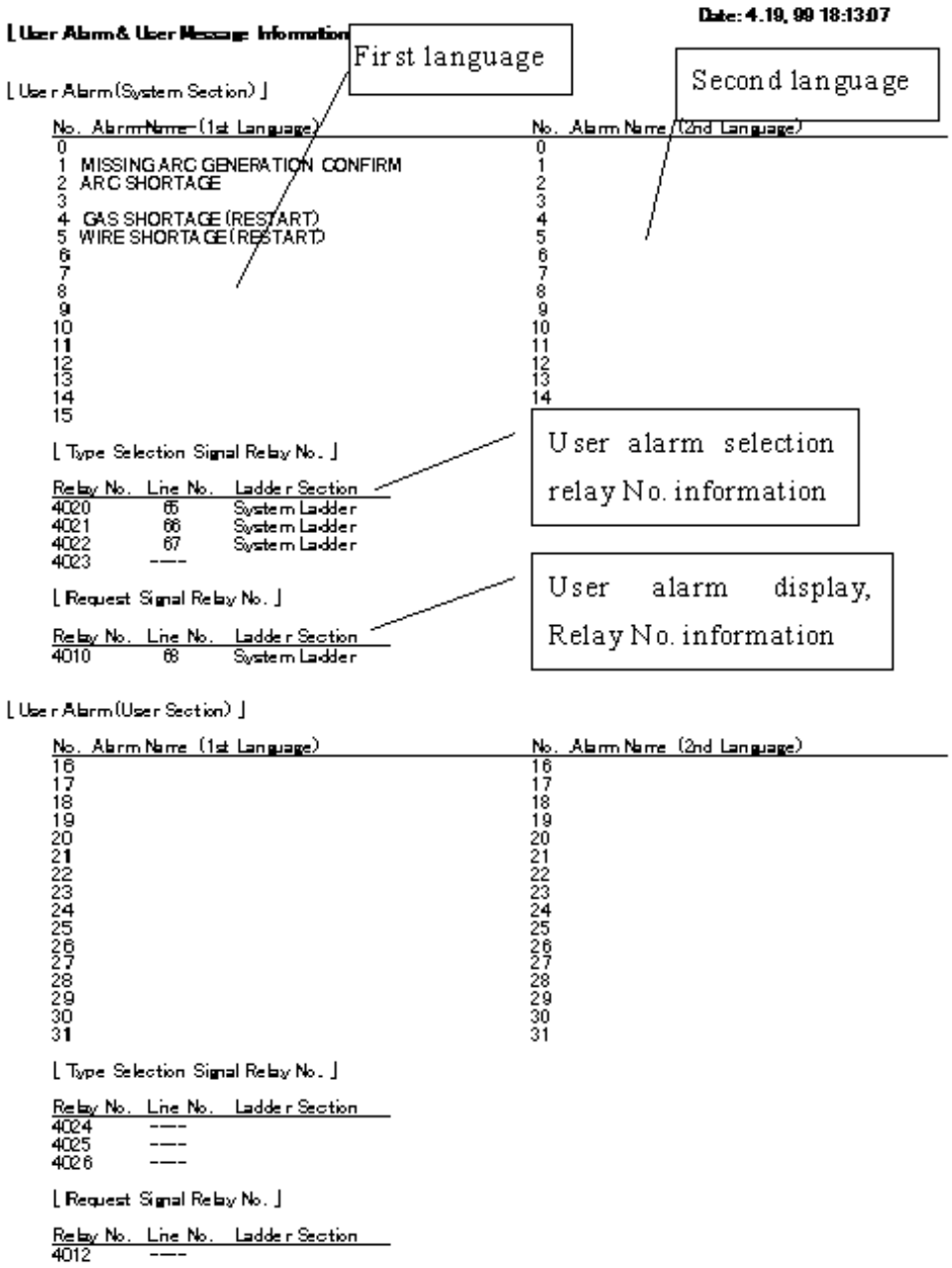


Fig.44 Printing user alarm list

Date: 4.19, 99 18:13:07

[User Alarm & User Message Information] Name: ARCWELD

[User Message (System Section)]

No.	Message (1st Language)	No.	Message (2nd Language)
0		0	
1	WIRE STICKING	1	
2	GAS SHORTAGE	2	
3	WIRE SHORTAGE	3	
4	RESTARTING FOR ARC	4	
5	RESTARTING FOR GAS	5	
6	RESTARTING FOR WIRE	6	
7	END OF ARC RESTARTING	7	
8		8	
9		9	
10		10	
11		11	
12		12	
13		13	
14		14	
15		15	

[Type Selection Signal Relay No.]

Relay No.	Line No.	Ladder Section
4030	70	System Ladder
4031	71	System Ladder
4032	72	System Ladder
4033	---	

[Request Signal Relay No.]

Relay No.	Line No.	Ladder Section
4011	73	System Ladder

[User Message (User Section)]

No.	Message (1st Language)	No.	Message (2nd Language)
16		16	
17		17	
18		18	
19		19	
20		20	
21		21	
22		22	
23		23	
24		24	
25		25	
26		26	
27		27	
28		28	
29		29	
30		30	
31		31	

[Type Selection Signal Relay No.]

Relay No.	Line No.	Ladder Section
4034	---	
4035	---	
4036	---	

[Request Signal Relay No.]

Relay No.	Line No.	Ladder Section
4013	---	

Fig.45 Printing user message list

The following describes the items of printed information. User alarms and user messages can be printed. Since each display item is the same, this paragraph describes printing of the user alarm list as an example.

■ *User alarm system section and user section*

A user alarm can be roughly classified as a system section that the system uses or a user section that the user can define freely. When printing, this information appears as the following word.

[User Alarm(*** Section)]***

■ *User alarm selection relay no. information*

Relay No. information is displayed to help select a used user alarm. A user alarm is specified by turning the following four relays ON/OFF.

4020, 4021, 4022, 4023

When printing, this information appears as the following word:

[Type Selection Signal Relay No.]

When each relay No. is actually used in a code, the line No. appears:

■ *User alarm display relay no. information*

Relay No. information which becomes a trigger to help display a user alarm appears. The relay No. that becomes a display trigger is **4010.**
When printing, this information appears with the following word.

[Request Signal Relay No.]

When each relay No. is actually used in a code, the line No. appears.

16. Transferring printing information to a text file

16.1 Transferring Ladder Diagrams to a Text File

Transfers an image of a ladder diagram to a text file.

[How to Operate]
Select [File] – [Output Text] – [Ladder Image] – [System Ladder (or User Ladder)].

16.2 Transferring Used Relay No. Lists to a Text File

Transfers the lists of relay Nos. used and the line Nos. referring to each relay No. to a text file. The system section and the user section are transferred together in the list of reference lines.

[How to Operate]
Select [File] – [Output Text] – [Relay No. use line list] – [System Ladder (or User Ladder)].

16.3 Transferring Used Register No. Lists to a Text File

Transfers the lists of register Nos. used and the line Nos. referring to each register No. to a text file. The system section and the user section are transferred together in the list of reference lines.

[How to Operate]
Select [File] – [Output Text] – [Register No. use line list] – [System Ladder (or User Ladder)].

16.4 Transferring Relay No. Use State to a Text File

Transfers the relay number use state to the text file in a "matrix" display.

[How to Operate]
Select [File] – [Output Text] – [Relay No. use state].

16.5 Transferring User Alarms and User Messages to a Text File

Transfers the user alarms and user messages to a text file.

[How to Operate]
Select [File] - [Output text] - [User alarm message]

17. Header information

17.1 Ladder name and system register editing

Edit the ladder program names and system registers.

How to Operate

1) Select [View] – [Header Information], or select from the main tool bar. (Refer to "Main tool bar").

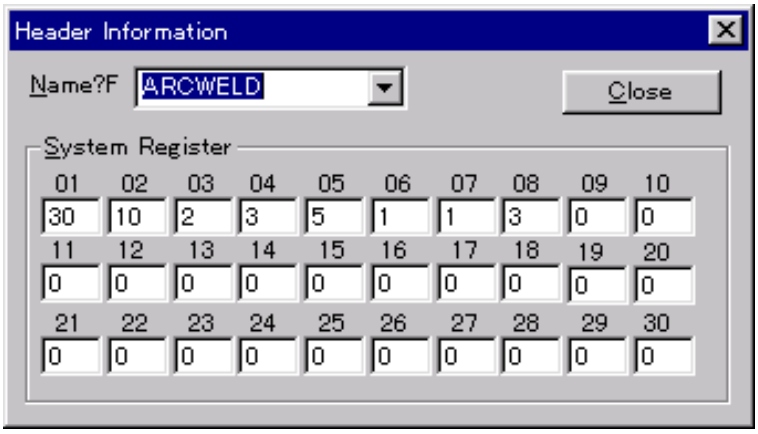


Fig.46 [Header information] dialog box

a) [Name] combo box.
Selects a ladder name. Normally, select one from the list in the combo box. A name can be entered directly. However, an improper name interrupts the loading to the controller.

b) System registers.
Sets the number of system registers.

18. User alarm and user message information

Edit the user alarms and user messages.

How to Operate

1) Select [View] – [Message Information], or select from the main tool bar. (Refer to "Message tool bar").

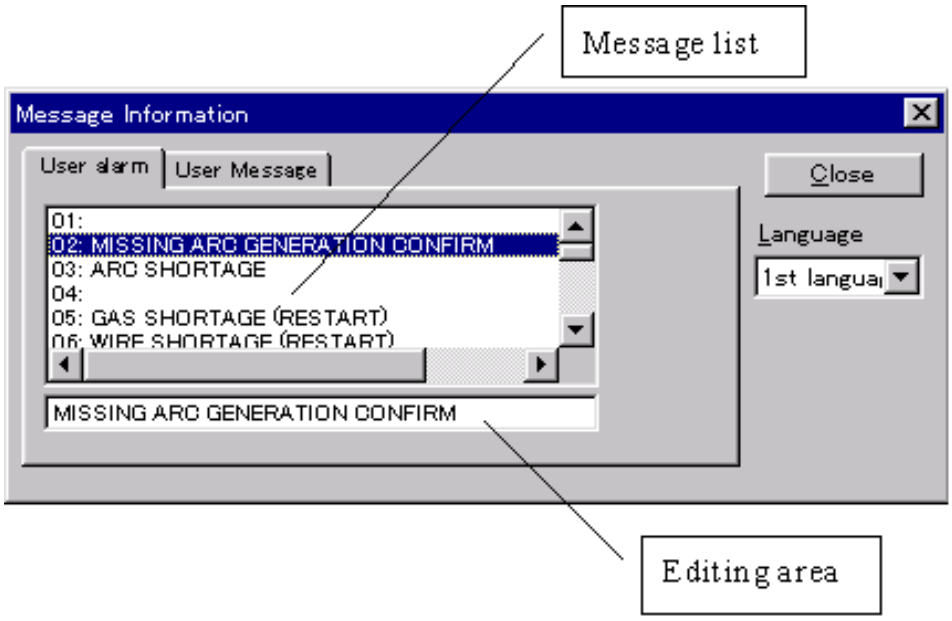


Fig.47 [Message Information] Dialog Box

Click the tag to select the user alarm and user message.

■ *Language combo box*

Each message has a first and a second languages. Select your desired language from the language combo box.

■ *Editing area*

Click the message to be edited in the message list, and the same message appears in the editing area. Edit the message in this area. When editing is completed, press the [Change] button.

18.1 User alarm and user message in system section

If the user account level does not reach the management level, only the information in the user section appears in the message list. To display or edit the information in the system section, change the user account level. (Refer to "User information management".)

19. System ladders and user ladders

19.1 User ladder and system ladder

A ladder program has a system ladder in the system Section and a user ladder in the user section. Because the manipulator may not move properly unless the system section is correctly edited, general users cannot edit the system section as well as the XRC. General users can edit only in the user ladder section. (Contact your Motoman representative when editing in the system section of the ladder program is required.)

20. Name file

20.1 What is name file?

Name file is a name information file to add a name to a relay No. or register No. used in the ladder program. (For the format of the name file, refer to "Name file format".)

20.2 Reading name file

Name file is read in at either one of the following times.

✔ When a ladder program file or CMOS file is open

✔ When a name file is read in from the menu

When a ladder program file or CMOS file is open, the name file is read in at the same time as the ladder program file or CMOS file. When a name file is read in from the menu, any existing name file can be read in whenever necessary.

The name file is saved in the same folder as the ladder program file or the CMOS file. (Even if a name file has not been prepared, the ladder program can still be edited. Refer to "Reading name file automatically".)

■ *Reading Name File Automatically (With Name File)*

When reading in a ladder program file or a CMOS file, Ladder Editor 32 automatically reads in the name file, too. The name file automatically read in is determined by the ladder name of the ladder program used as a keyword (refer to "Ladder Name and System Register Editing".

Example:

Ladder program name : ARCWELD

Read in file name : ARCWELD.NAM

■ *Reading Name File Automatically (Without Name File)*

If the desired name file is not available when automatically reading the name file, Ladder Editor 32 performs the operation in the following manner.

1) Selects a file suitable for the desired ladder program from the name template file prepared in default.

2) Copies the selected template file to the same directory as the ladder program file.

3) Reads in the copied template file as a name file.

In this case, Ladder Edit 32 refers to the ladder names to be read in to select the template file.

However, when the user changes the ladder name of the ladder program file, Ladder Editor 32 may not find any file name that coincides with the ladder name template file. In such a case, the [Select name template] dialog box appears.

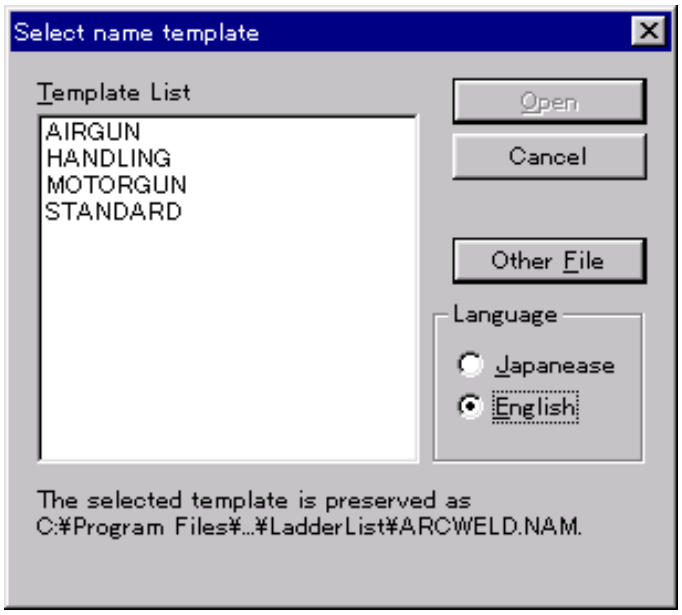
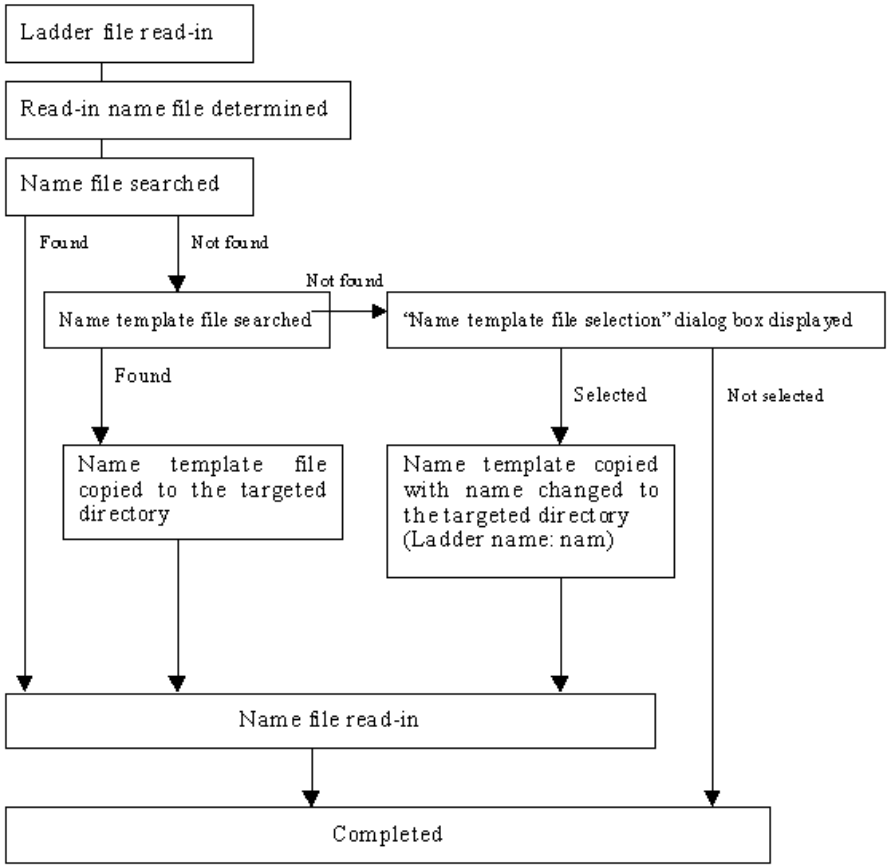


Fig.48 [Select Name Template] Dialog Box

Select the template suitable for the desired ladder program. Clicking the [Cancel] button stops the automatic reading of the name file.

The following shows the simple flowchart of the automatic reading.



20.3 Storing Name File

Store the edited name information by one of the following two methods.

■ *Stores it manually*

How to operate 1

1) Select [File] – [Save relay name]. When the [Save As] dialog box appears, input an arbitrary name for the name file to store it. Normally, the file name is stored in the following format.

Ladder name. NAM

Example: ARCWELD.NAM

2) For the ladder names, refer to "Header information".

■ *Stores it automatically*

How to operate 2

Setting the option stores the name file automatically. Refer to " Automatic storing function of name file".

20.4 Name Template File

Name template file is installed automatically when Ladder Editor 32 is setup. The following folder is created in the folder where the Ladder Editor 32 execution module exists, and the name template file is stored in this folder.

"Template"

21. Relay/register name list display function

The relay name list display function and register name list display function can display the name list for all relay Nos. and register Nos.. All the data of the read-in name files can be cross referenced. This "list display" dialog box has the editing function. The name information of an arbitrary relay or register No. can be edited.

■ *How to operate "relay name list" display*

1) Select [View] – [Relay No. Name list]. The [Relay name list] dialog box appears as in fig. (Some machines take time to display it.)

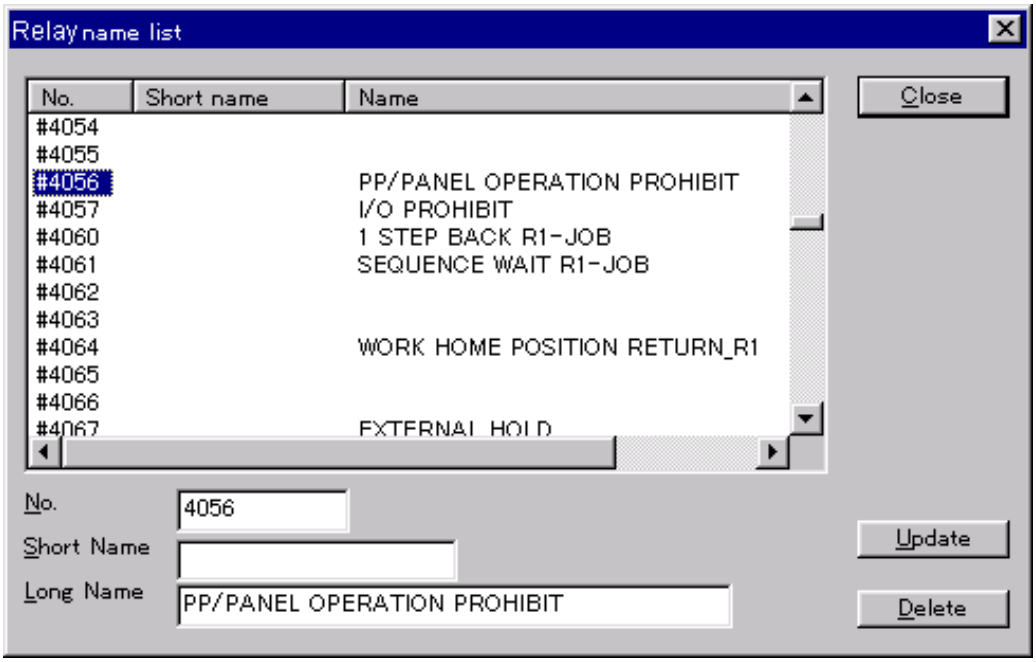


Fig.49 [Relay Name List] Dialog Box

By selecting any desired relay No. from the list, the currently set data appears in the [No.], [Short Name] and [Long Name] columns. Edit the data here. After editing, click the [Update] button to register the edited data.

If the [Short Name] and the [Long Name] are similar for two or more relay Nos., change only the [No.], and then click the [Update] button. The name previously entered will remain. Because the names are similar, change only the characters that are different. The entire name does not have to be re-entered.

■ *How to operate "register name list" display*

1) Select [View] – [Register Name List]. The [Register name list] dialog box appears as in fig. (Some machines take time to display it.)

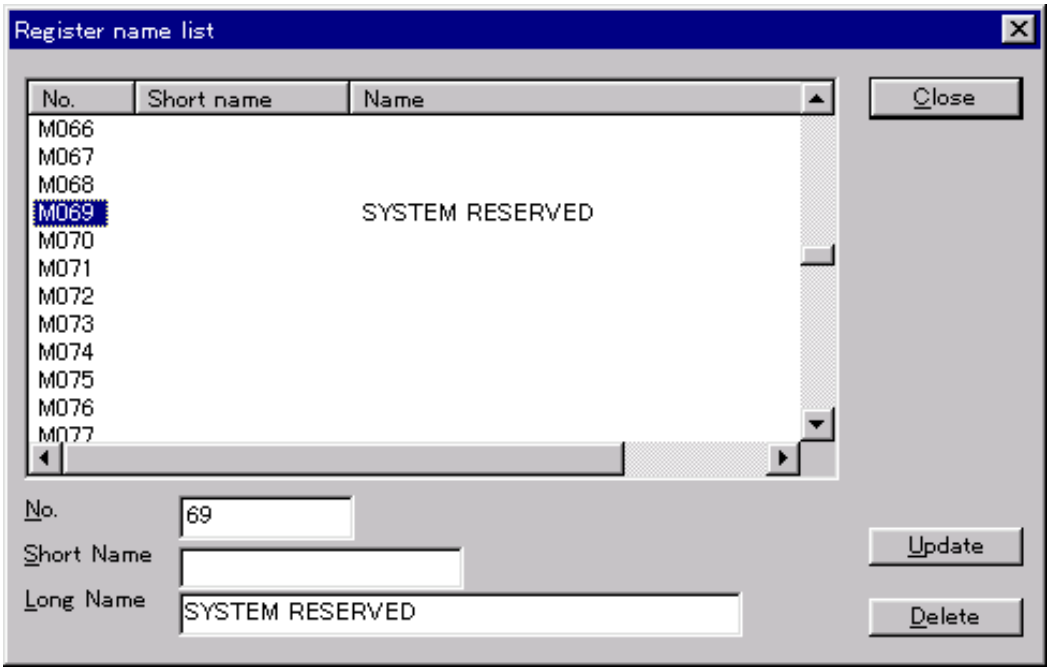


Fig.50 [Register Name List] Dialog Box

2) Editing procedure is the same as that of "Relay No. List" Display.

Normally, edit a relay or register name by opening the [Input name] dialog box on the ladder diagram. However, relay Nos. or register Nos. not used for ladder diagrams cannot be less of edited. These lists can be used to edit the names for all the relay or register Nos. regardless whether or not they are used on the ladder diagram.

22. Line jump function

The line jump function searches for and jumps to the line with the keyword.

22.1 Line No. Search Jump

This function jumps to the specified line No.

How to operate

1) Select [Edit] – [Find Line No.], or select (black) from the search jump tool bar (refer to "Search jump tool bar").
When the dialog box shown in fig. below appears, enter the line No. to jump and click the [OK] button.

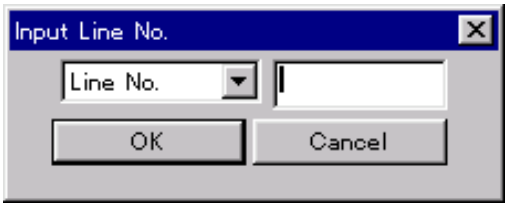


Fig.51 "Line Search" Dialog Box

22.2 Parts set value search jump

This function searches for values such as relay Nos., register Nos., and constants set to the ladder parts, and then jumps to the line with the set values.

How to operate

1) Select [Edit] – [Find setting value] – [Find], or select (brown) from the search jump tool bar (refer to "Search Jump Tool Bar").

2) When the dialog shown in fig. below appears, enter the type of the value and the set value to be searched and click the [OK] button.

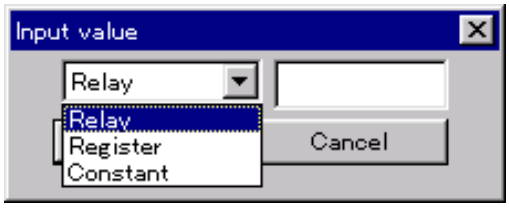


Fig.52 "Set Value Searching" Dialog Box

■ Previous/Next Search Jump

Previous search and next search functions can be used for searching for parts set values only.

How to operate

1) For a previous search, select [Edit] – [Find setting value] – [Back find].

Or select (brown) from the search jump tool bar (refer to "Search Jump Tool Bar").

2) For next search, select [Edit] – [Find setting value] – [Next Find].

Or select (brown) from the search jump tool bar.

Previous Search

Previous search is a function to search for the set value in front of the current line (in the direction of smaller line No.).

Next Search

Next search is a function to search for the set value behind the current line (in the direction of greater line No.).

Unless new set values are entered by pressing [Edit]-[Find setting value]-[Back find] or [Next find], the set values to be searched for do not change.

This function can be used to easily know where and how the set values are used.

22.3 OUT parts relay no. search jump

The OUT parts relay No. search jump function searches only for the relay No. set to the OUT parts of the ladder parts and jumps there. Other ladder parts can not be searched for.

How to operate

1) Select [Edit] – [Find OUT Relay No.]. Or select from the search jump tool bar (refer to "Search Jump Tool Bar").

2) When the dialog box shown in fig. below appears, input the relay No. to be searched for and click the [OK] button.

Fig.53 "Line Search" Dialog Box

This function can be used to analyze the conditions in which the relay used in the line turns ON retroactively.

22.4 History Jump

The history jump function stores the line jump functions used in the past as the history and easily returns to the previous jump source.

This function does not exist as a menu item; Only available as a tool bar button.

How to operate

1) Select or from the search jump tool bar.
(Refer to "Search jump tool bar").

This history jump button can freely move to the line registered as jump history. Normally, this function is disabled. When jumps are performed, this function becomes enabled.

■ *Application*

An example of its most useful application is used together with "OUT parts relay No. search jump". When searching for certain relay No. ON/OFF conditions using the "OUT parts relay No. search jump", a search jump may also be performed in the further advanced lines for retroactive analyses. After completion of analysis, this history jump function can easily return to the previous line.

23. Cross reference function

23.1 Ladder Parts Set Value and reference line list display function

The ladder parts set value and reference line list display function displays on which line and for which ladder parts the specified set values are used.

How to operate

1) Select [View] – [Value Reference line list]. The dialog box shown in fig. appears.

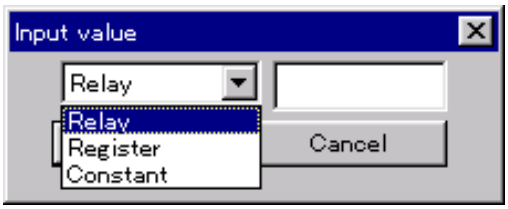


Fig.54 [Input Value] Dialog Box

2) After inputting the targeted set value type and the value, click the [OK] button. The [Reference line list] dialog box appears.

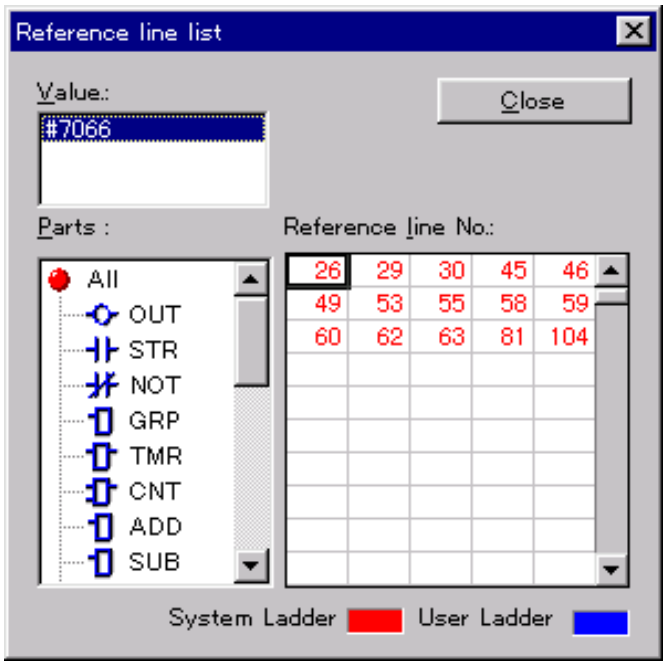


Fig.55 [Reference Line List] Dialog Box

■ [Value] (Reference Data) List Box

The list contains the set values to be searched for. Normally, there is only one item. However, since more than two items may appear occasionally, select one.

■ [Parts] Tree

The tree consists of ladder parts. Selecting this tree item can limit the line Nos. displayed in the [Reference line No.] matrix.

For example, selecting "STR" item displays only the line Nos. with the set values for "STR" parts.

■ *[Reference Line No.] Matrix*

Displays the line Nos. referring to the set values selected in the [Value] (reference data) list box. The line No. appears in red if the detected line No. is within the system ladder area, and in blue if it is within the user ladder area.

Application

Set values in the ladder parts may be referenced by several other lines. In such cases, this function is useful to analyze where it is used or to know how it is used in other lines.

■ *Line Jump from [Reference Line List] Dialog Box*

The line jump from [Reference line list] dialog box function can jump to an arbitrary line from the [Reference line list] dialog box. As shown in Fig. below, double-clicking the desired line No. on the [Reference line No.] matrix moves to the targeted line.

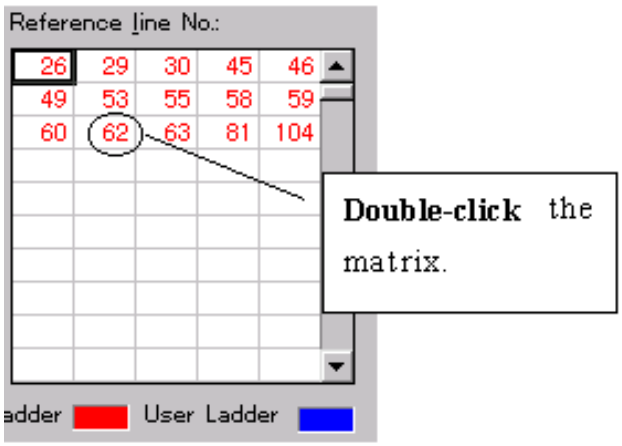


Fig.56 Double-clicking Reference Line List

Even if a line jump is performed by double-clicking, the [Reference line list] dialog box does not disappear. Another jump to another line can be performed.

23.2 Function to display the relay no. use state list

This function displays which relay Nos. are used or not used in the ladder program that is being edited.

How to operate

1) Select [View] – [Relay No. use state list]. The dialog box shown in fig. appears.

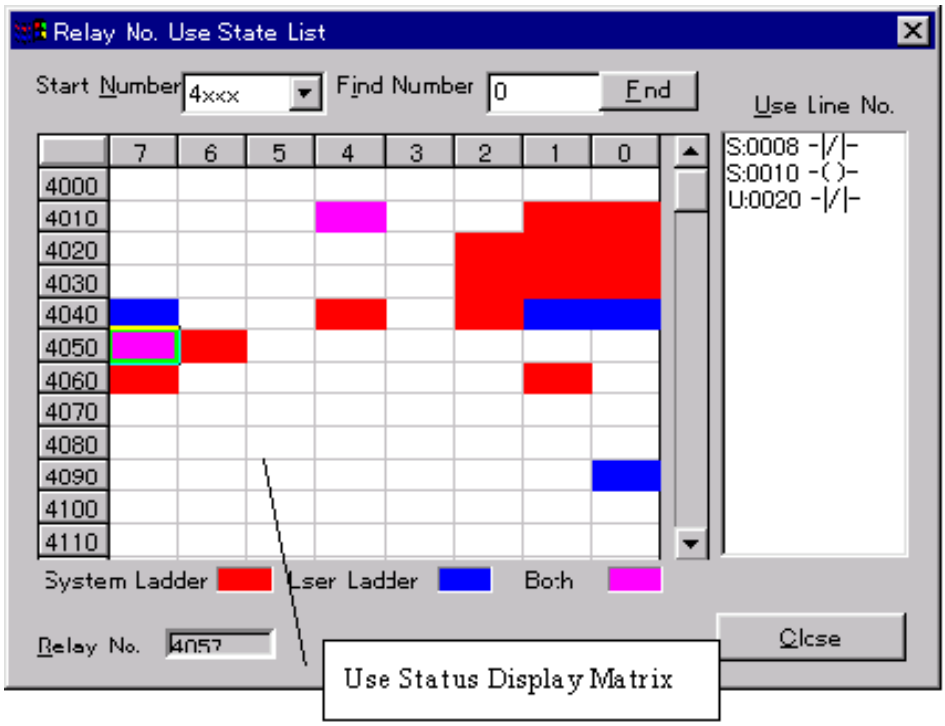


Fig.57 [Relay No. Use State List] Dialog Box

■ Use State Display Matrix

Relay Nos. used are displayed in the following colors:

Red : Used in a system ladder.

Blue : Used in a user ladder.

Purple : Used in both system and user ladders.

In the matrix, the vertical axis displays the 10th or higher digits of the relay Nos. in units of 10, while the horizontal axis displays the 1st digit of the relay Nos.. Therefore, in the case of the use state display matrix in fig. the left top matrix is the relay No. 4007.

Clicking the colored matrix displays the list of used line Nos. in the [Use Line No.] list box.

■ [Start Number] Combo box

The use state appears in the "use state display matrix" in units of 1000. Select the unit in the [Start Number] combo box.

■ [Find Number] Input Box

Inputting the relay No. in this input box and clicking the [Find] button displays the specified relay No. in the matrix display.

■ *[Use Line No.] List Box*

In the [Use Line No.] list box, the line information referring to the relay No. selected in the "use state display matrix" appears in the format shown in fig.

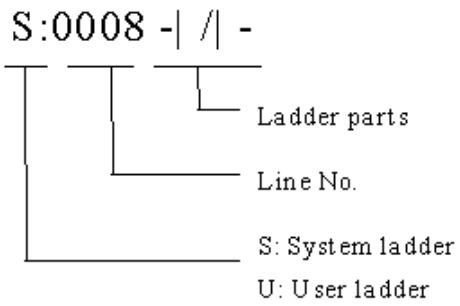


Fig.58 Format of [Use Line No.] List Box

Application

When various relay Nos. are to be added or changed, this function is useful to use any unused relay Nos.

■ *Line Jump from [Relay No. Use State] Dialog Box*

The line jump from [Relay No. use state] dialog box function can jump to an arbitrary line from the [Relay No. Use State] dialog box.

As shown in Fig. below, double-clicking an item in the [Use Line No.] list box moves to the targeted line.

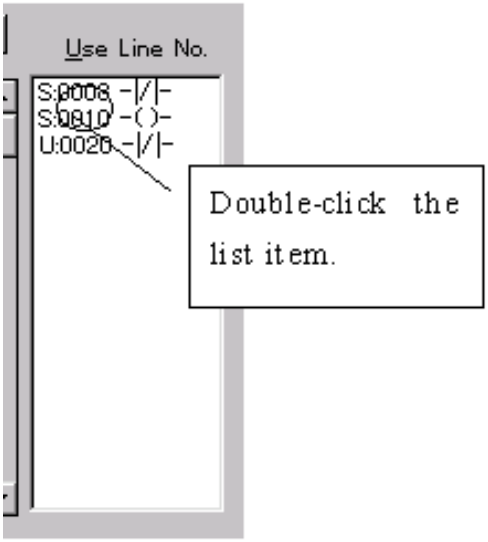


Fig.59 Double-clicking Use Line List Item

Even if a line jump is performed by double-clicking an item, the [Relay No. Use State List] dialog box does not disappear. Another jump to another line can be performed.

24. Other settings

24.1 Setting color

Set the colors of the information displayed in the "ladder editing" display.

How to operate

1) Select [Option] – [Color]. The dialog box shown in fig. below appears.

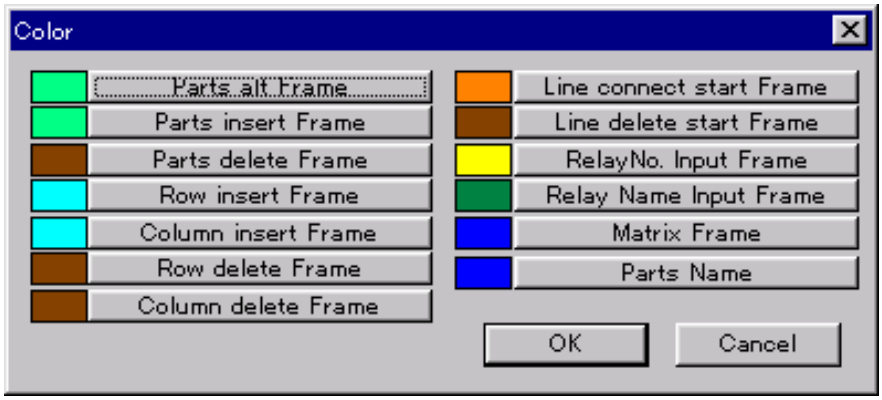


Fig.60 [Color] Dialog Box

2) Select each item. The dialog box shown in Fig. below appears. Select and set any desired color.

Fig.61 [Color] Dialog Box

24.2 Setting Font

Set the character font in the "ladder editing" display. Fonts can be set individually for the editing display and the preview display.

How to operate

1) Select [Option] – [Font] – [Edit screen font], or [Option] – [Font] – [Preview screen font]. The dialog box shown in fig. below appears.

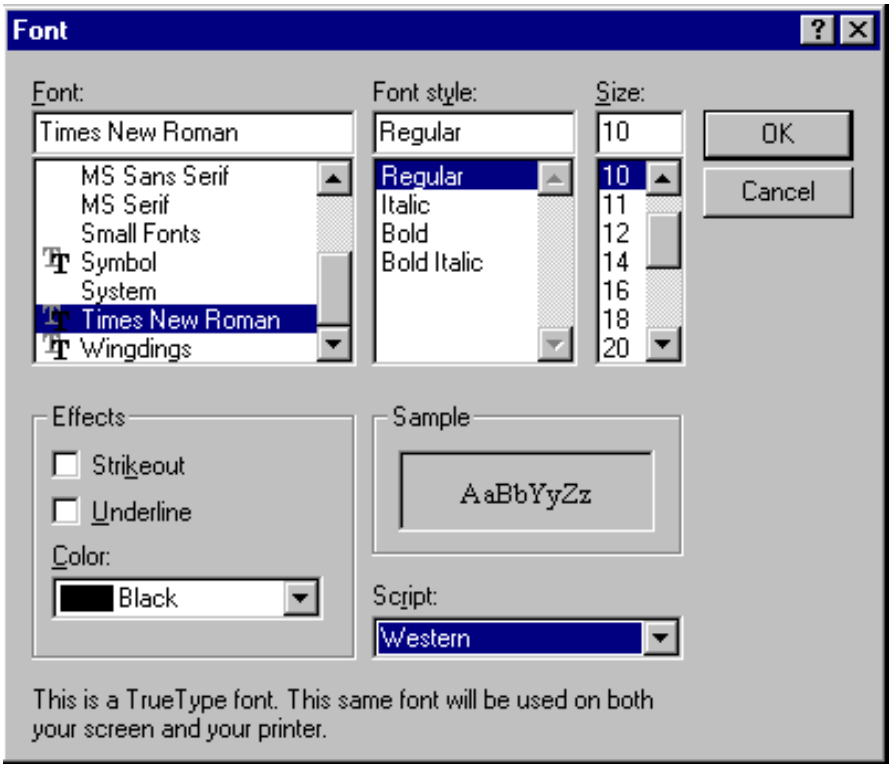


Fig.62 [Font] Dialog Box

2) Select any desired font name, the font style and size. Then click the [OK] button.

24.3 Automatic storing function of name file

Ladder Editor 32 has a function to store the name information automatically. Validating this function updates the name files automatically when storing the ladder information.

How to operate

1) Refer to “Other optional settings”.

2) If a relay name or register name is changed with this function invalid, an alarm message appears when the "ladder editing" display is closed. Store the data by selecting [File] – [Save relay name].

24.4 Automatic work storing function

If any interference occurs at editing and the application shuts down before storing the editing data, Ladder Editor 32 has a function to create a work file (data file being edited) automatically.

How to operate

1) Refer to "Other optional settings".

2) With this function, the data in its current state is stored in a work file when a line is changed, inserted, or deleted in the "ladder editing" display. The stored file is saved with the following file name in the same folder as the ladder program file or CMOS file that is being edited.

Opened file name + ".TMP"

Note!
Even if a CMOS.HEX file is read and edited, the work file is output as a ladder file (text file).

Note!
The data that is being edited in the "ladder editing" display is not stored.

24.5 Automatic Backup Function of the Read-in File (Original File)

When storing edited data, Ladder Editor 32 has a function to automatically back up the files before editing.

How to Operate
Refer to "Other Optional Settings".

The automatic backup function is available for the following files:
✔ Ladder files (*.LST)
✔ CMOS files (*.HEX)
✔ Name files (*.NAM)

A file name of one of these backup files has an "_" (under score) after each file extension in the same folder as the original files:

Relevant file name + extension + "_"

24.6 Work file forced output function

Ladder Editor 32 stores only the ladder programs in which compiling and grammatical checks, etc. are completed normally. However, the procedure may be interrupted temporarily during editing. To store a ladder program that cannot be compiled during editing, it can be forcely stored as a work file.

How to operate

1) Select [Option] – [Save tempolary file].

2) When the [Save File] dialog box appears, use an arbitrary file name to store it.

Note!
Even if the reading source is a CMOS file, a work file can only output a text file as a ladder program file.

24.7 Automatic updating function

If an attempt to move to another line is made without selecting [Line Alt] or [Line Insert] when the data has been edited in the "ladder editing" display, one can select whether the [Verification] dialog box appears or the line is to be updated automatically.

For automatic updating, select either [Auto alt update] or [Auto insert update].

How to operate

1) Displaying the [Verification] dialog box.
Select [Option] – [Auto update mode] – [Confirm Line Alt] to place checkmark in the box.

2) Updating automatically
Select [Option] – [Auto update mode] – [Confirm Line Alt] to remove the checkmark. When the checkmark is removed, select either [Option] – [Auto update mode] – [Auto alt update] or [Option] – [Auto update mode] – [Auto insert update] .

24.8 Switching short name display/non-display

Relay names and register names have information for short names. A short name can appear along with the relay No. or register No. corresponding to it in the "ladder editing" display.

How to operate

1) Select [View] – [Display short name] to place checkmark in the box.

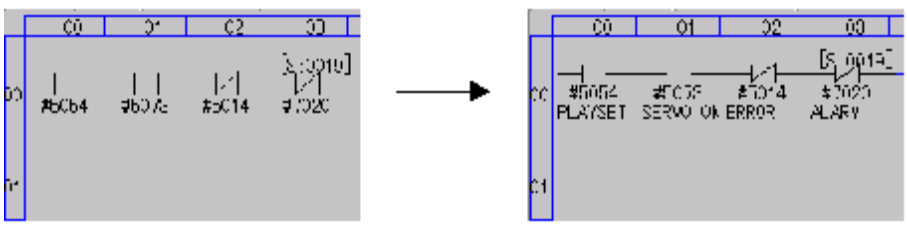


Fig.63 "Short Name" Display

24.9 Other Optional Settings

Select the Ladder Editor 32 optional functions.

How to Operate

1) Select [Option] – [Option], and the [Option] dialog box appears.

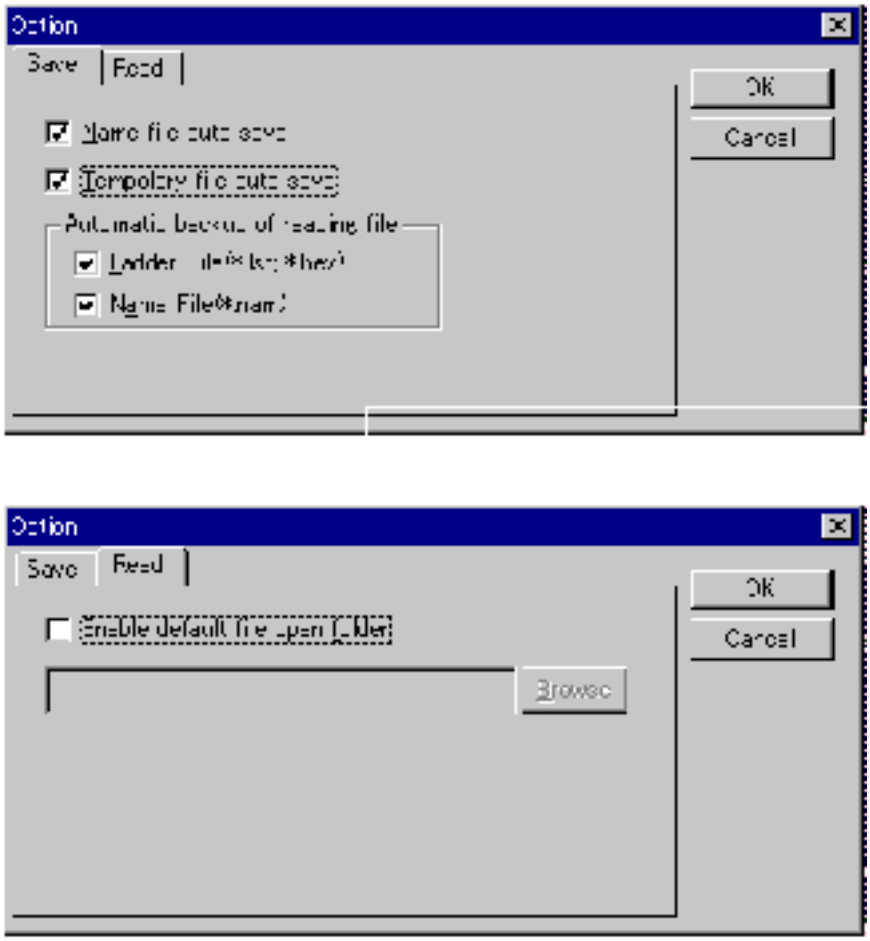


Fig.64 [Option] Dialog Box

Name file auto save:
Automatically stores a name file at the same time as a ladder file (or CMOS.HEX).
Refer to "Automatic Storing Function of Name File".

Temporary file auto save:
Automatically stores the existing data as a temporary file before editing when overwriting a line or inserting a line.
Refer to "Automatic Work File Storing Function".

Automatic backup of reading file:
Creates a backup of an original file when storing a ladder file or name file.
Refer to "Automatic Backup Function of Read-in Files (Original Files)".

Enable default file open folder:
Sets the default folder of the [Open] dialog box which appeared when [File] – [Open] were selected.

25. Changing user account level

Change the user account level in the [Input Password] dialog box (Fig. "[Input Password] Dialog Box for Easy Mode" or fig. "[Input Password] Dialog Box for Standard Mode").

How to Operate

1) Displays the [Input Password] dialog box for logging in.
Select [Option] – [System] – [Input Password].

2) Input the password.
When a [Input Password] dialog box appears, input the log-in name or the password, and click the [OK] button.

Fig.65 [Input Password] Dialog Box for Easy Mode

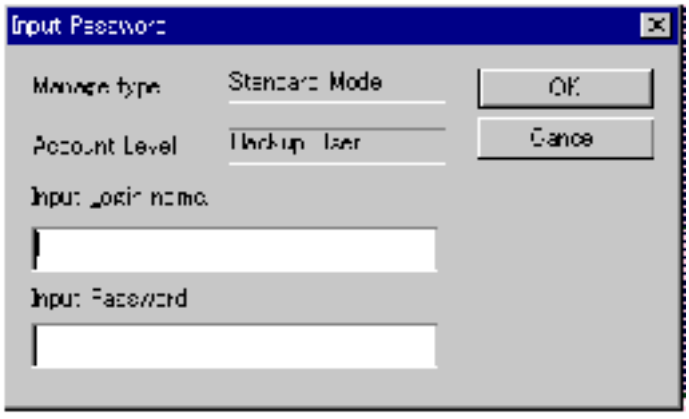


Fig.66 [Input Password] Dialog Box for Standard Mode

26. User information management

26.1 How to manage user account

LadderEditor 32 manages the user accounts using the log-in names and the passwords to limit acces to important data. The user accounts can be managed in "Easy Mode" and "Standard Mode". The administrator of the user account levels can change the management mode. For strict user management, select "Standard Mode". The table describes the features of each management mode.

Function	Easy Mode	Standard Mode
User ID input at log-in	Not necessary. Only the password is necessary.	Necessary
Password input at application startup	Selectable	Necessary
Registration, modification and deletion of user	Not available	Necessary
User account level when the password input is not necessary at the startup	Backup user	Necessary

Note!
"Easy Mode" is the default management mode when Ladder Editor 32 is initially started up, and an [Input password] dialog box appears at the startup.

26.2 Difference depending of the account levels

The table shows the authorized functions for each account level.

Account level	1 Low ◄	2	► 3 High
Classification	Backup operator	Operator	Administrator
Meaning	Mode for backup operator	Mode for general operator	Mode for administrator who sets up Ladder Editor 32 and is in charge of the maintenance of the system.
Authorized Functions	•Reading •Reading-in name files •Printing •Cross-referencing •Text output	•Reading •Read-in name files •Printing •Cross-referencing •Text output •Editing •Storing	•Reading •Read-in name files •Printing •Cross-referencing •Text output •Editing •Storing •Setting account management modes •Managing user information

The default users as shown in the table below have already been registered in the user accounts. Use the password assigned to each user.

Account level name	User name
Administrator	admin
Operator	user
Backup operator	backup

For each default user's password, refer to the "Deafault user names and password list" included with the shipment. The software administrator is responsible for storage and management of this list.

Any user other than the default users can be registered in the [User Manager] dialog box. (However, it is needed to perform the log-in for the user account at the "administrator" level.)

How to operate

1) Select [Option] – [System] – [User Manager]. The dialog box shown in fig. appears.

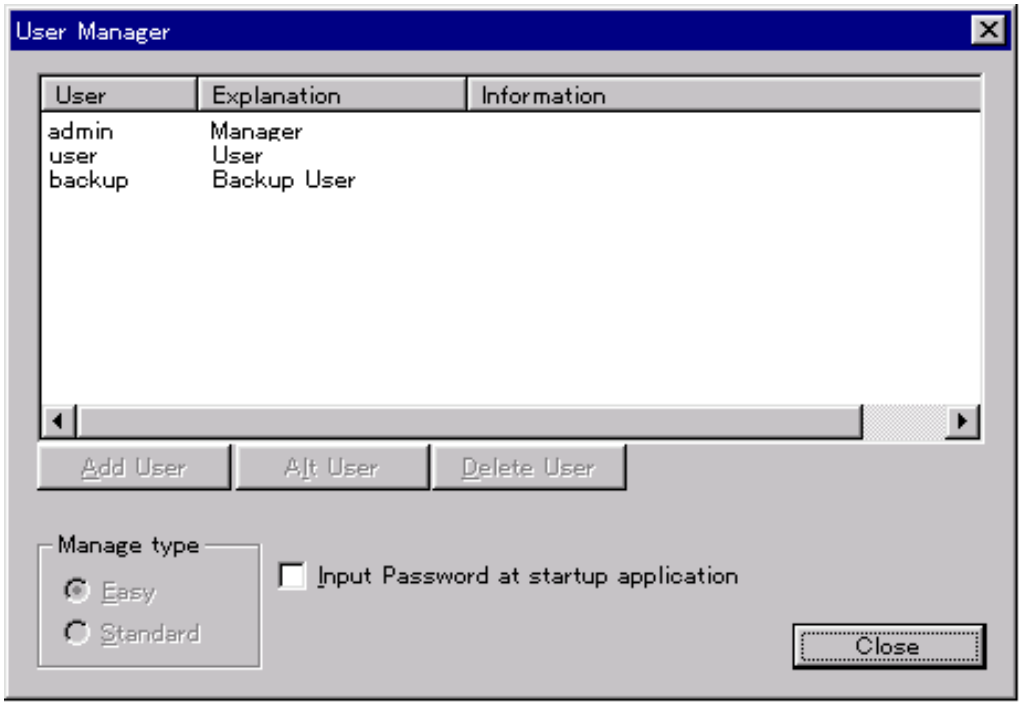


Fig.67 [User Manager] Dialog Box

[Add User] button:

Adds a new user.

Refer to "Adding / Changing the user".

[Alt User] button:

Changes the password or account level of the existing user. The default user information cannot be changed. (However, only password can be changed for the "user")

Refer to "Adding / Changing the user".

[Delete User] button:
Deletes an existing user. The default users cannot be deleted.

Manage type:
Select one of two methods to manage use accounts: "Standard Mode" and "Easy Mode"
Refer to "How to manage user accounts".

"Input password at startup application" check box:
Select this checkbox and the [Input Password] dialog box will always appear the next time Ladder Editor 32 is started up.

26.3 Adding/Changing the User

Click the [Add User] or [Alt User] button, and the [Regist new user] dialog box (Fig. "[Regist new user] Dialog Box") or the [Alternate exist user] dialog box (Fig. "[Alternate exist user] Dialog Box") appears.

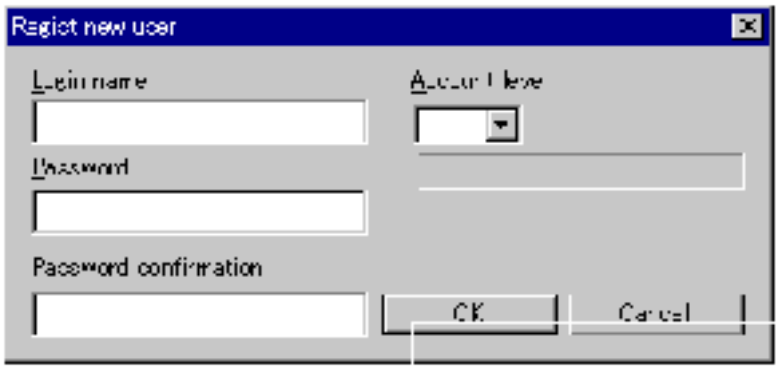


Fig.68 [Regist new user] Dialog Box

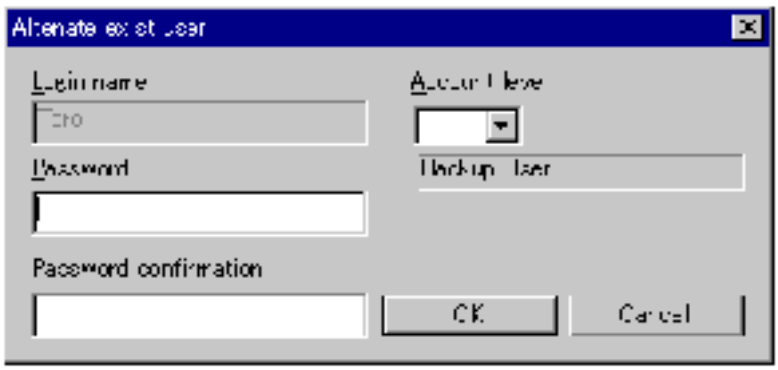


Fig.69 [Alternate exist user] Dialog Box

Input the [Login Name], [Password], [Password confirmation], and [Account Level], and then click the [OK] button. The log-in name cannot be changed in the [Alternate exist user] dialog box.

27. Appendix

27.1 Description of menu

Menu	Function	Button
File	-	
New	Creates a new ladder program in default.	
Open	Opens an existing ladder program.	
Close	Closes the ladder program that is being edited.	
Save	Saves an overwritten ladder program in which compiling after editing is completed successfully. To save a ladder program that is being edited and cannot be compiled, use [Option] – [Save tempolary file].	
Save As	Select the storage file name to save the ladder program in which compiling is completed successfully.	
Load relay name file	Reads in a name file for the ladder program that is being edited.	
Save relay name	Saves the relay name information. Can be selected when a relay name is edited.	
Print	-	
Ladder Image	-	
User Ladder	Prints ladder diagram images of the user ladder.	
System Ladder	Prints ladder diagram images of the system ladder.	
Relay No. use line list	-	
User Ladder	Prints the relay No. list used in the user ladder.	
System Ladder	Prints the relay No. list used in the system ladder.	
Register No. use line list	-	
User Ladder	Prints the register No. list used in the user ladder.	
System Ladder	Prints the register No. list used in the system ladder.	
Relay No. use state	Prints the relay No. use state matrix.	
User alarm User message	Prints user alarms and user messages.	
Preview	-	
Ladder Image	-	

User Ladder	Previews ladder diagram images of the user ladder.	
System Ladder	Previews ladder diagram images of the system ladder.	
Relay No. use line list	-	
User Ladder	Previews the relay No. list used in the user ladder.	
System Ladder	Previews the relay No. list used in the system ladder.	
Register No. use line list	-	
User Ladder	Previews the register No. list used in the user ladder.	
System Ladder	Previews the register No. list used in the system ladder.	
Print Relay No. Use State	Previews the relay No. use state matrix.	
User alarm User message	Prints user alarms and user messages.	
Printer Setting	Displays the "printer setting" dialog box.	
Exit	Closes Ladder Editor 32.	
Edit	-	
Undo	Returns the edited contents to the previous state.	
Redo	Retries the operation that was returned to by [Return] operation.	
Insert new line	Inserts a new line after the selected line.	
Cut	Deletes the ladder diagram information of the selected line.	
Copy	Copies the ladder diagram information of the selected line.	
Paste	Pastes the contents of [Cut] or [Copy] on the selected line. The ladder information that existed before pasting disappears.	
Insert Paste	Inserts the contents of [Cut] or [Copy] into the selected line. All the lines after the selected line are moved backward.	
Line control	-	
Line Alt	Overwrites and updates the ladder diagram information on the currently edited ladder diagram information for the currently displayed line.	

Line Insert	Inserts the currently edited ladder diagram information to the next line of the currently displayed line.	
Clear	Clears the ladder diagram information of the currently displayed line.	
Compile	Compiles the currently displayed ladder program. Compiling checks for mistakes in the edited ladder program (such as overlapped relay Nos., measurement of processing time).	
Find setting value	-	
Find	Searches for relay Nos., register Nos. or set constants.	
Back find	Searches for set values in the direction of the smaller line No..	
Next find	Searches for set values in the direction of the greater line Nos..	
Find OUT Relay No.	Searches for relay Nos. used in the OUT terminal.	
Find Line No.	Searches for the specified line and jumps there.	
View	-	
Toolbar	Switches between display/non-display of the tool bar.	
Search Jump bar	Switches between display/non-display of the search jump bar.	
Parts select bar	Switches between display/non-display of the parts selection bar.	
Parts control bar	Switches between display/non-display of the parts control bar.	
Statusbar	Switches between display/non-display of the status bar.	
Header Information	Displays the header information of the ladder program in operation.	
Message Information	Displays the message information of the ladder program in operation.	
Value Reference line list	Displays the list of lines which uses specified set values (relay Nos., register Nos., constants).	
Relay No. use state list	Displays the relay No. use state matrix.	
Relay No. name list	Displays the relay name list.	

Register name list	Displays the register name list.	
Display short name	Selects whether the relay short name is to be over-lapped with the ladder diagram in the display.	
Display relay reference OUT line no.	Selects whether the line No. using each relay No. on the ladder diagram for the OUT terminal is to be over-lapped with the parts in the display.	
Jump Top line	Moves to the first line.	
Jump End line	Moves to the last line.	
Tool	-	
Mode	-	
Delete Parts	Changes the edit mode to the deletion mode.	
Column control	-	
Insert Column	Changes the edit mode to the line insertion mode.	
Delete Column	Changes the edit mode to the line deletion mode.	
Row control	-	
Insert Row	Changes the edit mode to the row insertion mode.	
Delete Row	Changes the edit mode to the row deletion mode.	
Input No.	Changes the edit mode to the set value input mode.	
Input Relay Name	Changes the edit mode to the name input mode.	
Mode Reset	Clears the edit mode.	
Parts	-	
STR	Changes to the set mode of STR parts.	
STR-NOT	Changes to the setting mode of STR-NOT parts.	

GRP	Changes to the setting mode of GRP parts.	
TMR	Changes to the setting mode of TMR parts.	
CNT	Changes to the setting mode of CNT parts.	
OUT	Changes to the setting mode of OUT parts.	
Option	-	
System	-	
Input Password	Displays the "password input" display. Needed to edit in the system section.	
User Manager	Displays the "user manager" dialog box.	
Ladder Section	-	
System Ladder	Changes a ladder to be edited into a ladder in the system section. Only users at the manager level can edit the ladders in the system section.	
User Ladder	Changes a ladder to be edited into a ladder in the user section.	
Color	Sets the graphic color displayed in the "ladder editing" display.	
Font	-	
Edit screen font	Sets the character font displayed in the "ladder editing" display.	
Preview screen font	Sets the character font displayed in the "ladder preview" display.	
Name file auto save	Switches automatic name file storage ON/OFF.	
Tempolary file auto save	Switches automatic work file storage ON/OFF.	
Save tempolary file	Outputs a work file. Can be selected when [Line Alt] or [Line Insert] is selected.	
Auto update mode	-	
Confirm Line Alt	Detects modification to the ladder diagram when moving to another line during editing, and selects whether the message to verify modification is to be displayed or not.	

Auto alt update	With [Verify at Editing] above OFF, detects modification to the ladder diagram when moving to another line, and overwrites and updates the current line automatically.	
Auto insert update	With [Verify at Editing] above OFF, detects modification to the ladder diagram when moving to another line, and inserts the current line automatically to the line to be jumped.	
Window	-	
Cascade	Overlaps windows.	
Tile	Displays windows side by side.	
Arrange Icons	Arranges icons of iconized window.	
HELP	-	
Help Topics	Displays the contents of HELP.	
Search Keyword	Displays the "keyword search" dialog box of HELP.	
Using Help	Displays how to use HELP.	
About	Displays the version information.	

27.2 Description of Tool Bars

■ Main Tool Bar

Button	Function	Selection
	Creates a new ladder program file in default.	[File] - [New]
	Opens an existing ladder program.	[File] - [Open]
	Overwrites and saves a ladder program in which compiling after editing is completed successfully. To save a ladder program that is being edited and cannot be compiled, select [Option] - [Save tempolary file].	[File] - [Save]
	Deletes the ladder diagram information of the selected line.	[Edit] - [Cut]
	Copies the ladder diagram information of the selected line.	[Edit] - [Copy]
	Pastes the contents of [Cut] or [Copy] on the selected line. The ladder information that existed before pasting disappears.	[Edit] - [Paste]
	Inserts the contents of [Cut] or [Copy] into the selected line. All the lines after the selected line are moved backward.	[Edit] - [Insert Paste]
	Returns the edited contents to the previous state.	[Edit] - [Undo]
	Retries the operation that was returned to by [Return].	[Edit] - [Redo]
	Inserts a new line after the selected line.	[Edit] - [Insert new line]
	Overwrites and updates the currently edited ladder diagram information for the currently displayed line.	[Edit] - [Line control] – [Line Alt]
	Inserts the currently edited ladder diagram information to the next line of the currently displayed line.	[Edit] - [Line control] – [Line Insert]
	Compiles the currently displayed ladder program. Compiling checks for mistakes in the edited ladder program (such as overlapped relay Nos., measurement of processing time).	[Edit] - [Compile]
	Displays the list of lines which uses specified set values (relay Nos., register Nos., constants).	[View] - [Value Reference line list]
	Displays the header information of the ladder program in operation.	[View] - [Header Information]
	Displays the message information of the ladder program in operation.	[View] - [Message Information]
	Changes a ladder to be edited into a ladder in the system section. Only users at the manager level can edit the ladders in the system section.	[Option] - [Ladder Section] - [System Ladder]
	Changes a ladder to be edited into a ladder in the user section.	[Option] - [Ladder Section] - [User Ladder]
	Displays the contents of HELP.	[Help] - [Help Topics]

■ *Parts Tool Control Bar*

Button	Function	Selection
	Changes the edit mode to the deletion mode.	[Tool] - [Mode] - [Delete Parts]
	Changes the edit mode to the line insertion mode.	[Tool] - [Mode] - [Column control] - [Insert Column]
	Changes the edit mode to the line deletion mode.	[Tool] - [Mode] - [Column control] - [Delete Column]
	Changes the edit mode to the row insertion mode.	[Tool] - [Mode] - [Row control] - [Insert Row]
	Changes the edit mode to the row deletion mode.	[Tool] - [Mode] - [Row control] - [Delete Row]
No.	Changes the edit mode to the set value input mode.	[Tool] - [Mode] - [Input No.]
	Changes the edit mode to the name input mode.	[Tool] - [Mode] - [Input Relay Name]
	Clears the "ladder diagram information" display of the currently displayed line.	[Edit] - [Clear]
	Clears the edit mode.	[Tool] - [Mode] - [Mode Reset]

■ *Search Jump Tool Bar*

Button	Function	Selection
	Searches for relay Nos. used in the OUT terminal.	[Edit] - [Find OUT Relay No.]
	Searches for relay Nos., register Nos., or set constants.	[Edit] - [Find setting value] – [Find]
	Searches for set values in the direction of the smaller line Nos..	[Edit] - [Find setting value] – [Back find]
	Searches for set values in the direction of the greater line Nos..	[Edit] - [Find setting value] – [Next find]
	Searches for the specified line and jumps there.	[Edit] - [Find Line No.]
	Moves to the first line.	[View] - [Jump Top line]
	Moves to the last line.	[View] - [Jump End line]
	Jumps backward in the jump history	
	Jumps forward in the jump history	

■ *Ladder Parts Tool Bar*

Button	Function	Selection
STR	Changes to the setting mode of STR parts.	[Tool] - [Parts] - [STR]
NOT	Changes to the setting mode of STR-NOT parts.	[Tool] - [Parts] - [STR-NOT]
GRP	Changes to the setting mode of GRP parts.	[Tool] - [Parts] - [GRP]
TMR	Changes to the setting mode of TMR parts.	[Tool] - [Parts] - [TMR]
CNT	Changes to the setting mode of CNT parts.	[Tool] - [Parts] - [CNT]
OUT	Changes to the setting mode of OUT parts.	[Tool] - [Parts] - [OUT]
ADD	Changes to the setting mode of ADD parts.	[Tool] - [Parts] - [ADD]
SUB	Changes to the setting mode of SUB parts.	[Tool] - [Parts] - [SUB]
MUL	Changes to the setting mode of MUL parts.	[Tool] - [Parts] - [MUL]
DIV	Changes to the setting mode of DIV parts.	[Tool] - [Parts] - [DIV]
MOD	Changing to the setting mode of MOD parts.	[Tool] - [Parts] - [MOD]
BIN	Changes to the setting mode of BIN parts.	[Tool] - [Parts] - [BIN]
BCD	Changes to the setting mode of BCD parts.	[Tool] - [Parts] - [BCD]
MOV	Changes to the setting mode of MOV parts.	[Tool] - [Parts] - [MOV]
WAND	Changes to the setting mode of WAND parts.	[Tool] - [Parts] - [WAND]
WOR	Changes to the setting mode of WOR parts.	[Tool] - [Parts] - [WOR]
WXOR	Changes to the setting mode of WXOR parts.	[Tool] - [Parts] - [WXOR]
WNOT	Changes to the setting mode of WNOT parts.	[Tool] - [Parts] - [WNOT]
SHL	Changes to the setting mode of SHL parts.	[Tool] - [Parts] - [SHL]
SHR	Changes to the setting mode of SHR parts.	[Tool] - [Parts] - [SHR]
ROL	Changes to the setting mode of ROL parts.	[Tool] - [Parts] - [ROL]
ROR	Changes to the setting mode of ROR parts.	[Tool] - [Parts] - [ROR]
PLS	Changes to the setting mode of PLS parts.	[Tool] - [Parts] - [PLS]
PLF	Changes to the setting mode of PLF parts.	[Tool] - [Parts] - [PLF]

■ ***Name file format***

The following shows the format of a name file.

//TYPE:ARCWELD : Ladder name

///0240 : Relay block No.

ssssssss,LLLLLLLL : Name of 0240

AAAAA,BBBBBBB : Name of 0241 (For eight items)

IN192,IN192(FAN Alarm) : Name of 0247

///1240 : Next relay block No.

Arestart, arc off restart processing memory reset: 1
restart, restart processing reset: 1
Inching, inching: 1
Retract, retract: 1

//REGISTER: : Specify register name section

M069=ssssssss,LLLLLLLLL : Register name

M090=,ARC ANS ERROR (PRE-SENT VALUE)

M091=,STICK-ING CHECK (PRE-SENT VALUE)

M092=,NO STICK-ING CHECK (PRE-SENT VALUE)

Relay Name:

Short name : Within 8 characters

Long name : Within 60 characters

?Register Name:?

M000 = Short name, long name

Short name : Within 8 characters

Long name : Within 60 characters

("M" must be added to the first character in the name.)

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